# The Value Added Tax and Red Tape: What Contributes More to Electricity Tariffs in the Philippines

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October 2016

ENERGY POLICY AND
DEVELOPMENT PROGRAM (EPDP)

USAID FROM THE AMERICAN PEOPLE

UPecon Foundation

Working Paper 2016-06

October 2016

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## Abstract

*Among several factors that may explain why electricity in the Philippines is expensive compared to other ASEAN member states, this paper zeroes in on two: the value added tax (VAT) and red tape in obtaining generation business permits. Legislators have raised the timeliness of lifting just the VAT on electricity to reduce electricity prices. This study however observes that red tape may contribute three times more than the VAT to making electricity costly in the country. The study uses a computable general equilibrium (CGE) model of the Philippine economy to explore the relative contributions of the two to electricity price, and simulate their economic effects. Besides reducing electricity prices, streamlining and shortening the business permitting process for new generation companies in the country will make the economy more efficient and raise the revenue from VAT.*

Keywords: Electric Energy, Electricity, Policy Analysis

JEL Code: Q48, D04, D58, H25

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* This paper is made possible by the generous support of the American People through the United States Agency for International Development (USAID) under the Energy Policy and Development Program (EPDP). EPDP is a four-year program implemented by the UPecon Foundation, Inc. The contents or opinions expressed in this paper are the author's sole responsibility and do not necessarily reflect the views of USAID or the United States Government or the UPecon Foundation, Inc. Any errors of commission or omission are the author's and should not be attributed to any of the above.

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**The Value Added Tax and Red Tape: What Contributes More to Electricity Tariffs in the Philippines**

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## 1. Introduction

This study looks at the relative contribution to the price of electricity of the value added tax (VAT) and red tape in obtaining business permits in the electricity industry of the Philippines. When the VAT was expanded in 2005, it was the result of the government's focus on finding new sources of revenue to avoid a looming fiscal crisis, which was likely to cut economic growth and the incomes of Filipinos.[1] It expanded the application of the VAT to uncovered transactions such as electricity services.

However, the following concerns received only secondary consideration from the government: the effect of VAT on electricity prices, economy and its residents. High energy cost deters investments elsewhere in the economy and makes the country's products less competitive [2,3,4]. Since electricity is needed not only in industry but also by the country's household sector, the VAT on the service is regarded widely to be a heavy burden to the country's residents, aggravating the problem of poverty.[5] When recently, a more stable and sound financial capacity was observed in the government, some policy makers saw the appropriateness and timeliness of lifting the VAT on electricity.

The support of the population and businesses to the delisting of electricity services from the VAT is understandably wide. But there may be better explanations why electricity prices are high in the country, which this paper aims to explore. Red tape in obtaining permits, paying taxes or attending to other business related concerns such as enforcing contracts raise the cost to do business in the sector, deterring investments.[6] With investments in new capacity lagging behind the growing demand for electricity in the economy, the price is expected to increase.

The country's electricity industry has specific features that potentially raise the average cost of doing business. Rood (2015) reported that based on estimates of the Department of Energy, investors in the electricity sector secure 165 signatures in a business permitting process that may last at least 3 years. Returns to investments are uncertain due to possible contractual adaptations or enforcement initiated by the government itself. Rood cited the effort of the previous Arroyo government to

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[1] In a contributed article to the Philippine Daily Inquirer, 11 UPSE professors wrote about the looming fiscal crisis in their paper "The Deepening Fiscal Crisis: The Real Score About Deficits and Public Debt". Talk of the Town, August 29, 2004. The publication triggered a public debate on the issue, but it eventually led to the filing of the bill expanding the coverage of the value added tax to include electricity.
[2] Rep. Arnulfo Fuentebella filed House Bill 1625 in the 16th Congress proposing to exempt the electricity industry from the VAT.
[3] Also during the 16th Congress, Senator Sergio Osmeña III filed Senate Bill 2714 removing electricity from the VAT system. Henceforth, we call these the House and Senate Bills, respectively.
[4] Senator Ralph Recto, in a radio interview in May 2015, advocated for the removal of the VAT on electricity. He authored the bill in 2005 which became Republic Act No. 9337 or EVAT Law, which included electricity in the VAT system.
[5] One out of every four Filipinos is considered poor.
[6] In the Doing Business Report 2015 by the World Bank, the Philippines ranking slid down in 8 of ten business related tasks, with the remaining two as they were in 2014.

renegotiate the public private partnership (PPP) contracts made during the electricity power crisis in the 1990s to get more favorable terms. In addition, the approval by the Energy Regulatory Commission (ERC) of proposed rate changes has been slow, reducing returns to investments from what were expected when the investments were made. The non-governmental sector can also be the source of the uncertainty. Getting the required permits does not always provide a guarantee that investors can proceed with their planned businesses. A non-governmental organization challenged the issuance of the permit by the ERC to a coal-fired plant in Subic Bay, and secured a Writ of Kalikasan[7].

Problems like these tend to raise the cost of starting an electricity generation business in the Philippines by investing in overcoming red tape. For some companies with better political connections and expertise, red tape may not be much of a problem. But potentially there may be more entrants into the industry, which may just be turned away not for lack of expertise in the business of electricity generation, but from inability to cope with red tape. It is the companies that the high cost of doing business had turned off that could have made generation capacity catch up with the potential growth of demand for electricity in the country, thus lowering its price.

This study looks at the relative contribution of the value added tax (VAT) and the red tape in getting business permits in the electricity power generation in the Philippines to the price of electricity. It compares the effects of the VAT on electricity and red tape in business permitting in generation using a dynamic computable general equilibrium model of the Philippine economy.

## 2. Nature and Causes of High Electricity Prices

High electricity prices is a far-reaching concern in Philippine society. Filipino residents have the highest residential electricity rates (Figure 1(a)) among the ASEAN 5 states, except Singapore.[8] Lawmakers in the 16th Congress had pushed for the lifting of the VAT on electricity to give financial relief to consumers.[9] A typical monthly bill from Meralco includes 10% covered by VAT. The lower income Filipino households, which use about 200 kwh a month of electricity on average, pay PhP 188.55 in VAT, with the price of electricity ranging from PhP 5.49 to 12.10 per kwh[10]. According to another estimate[11], removing the VAT on electricity is expected to give consumers monthly relief amounting to PhP 175, which is substantive relief for at least 25% of the country's population.

Besides household users of electricity, the country's business sector bears the consequences of high electricity prices. Industrial use of electricity is relatively high in the country (Figure 1(b)). The problem is often cited as among the important factors of the Philippines' low competitiveness ranking compared to its neighbors. Among the ASEAN 5 member states, the Philippines has consistently

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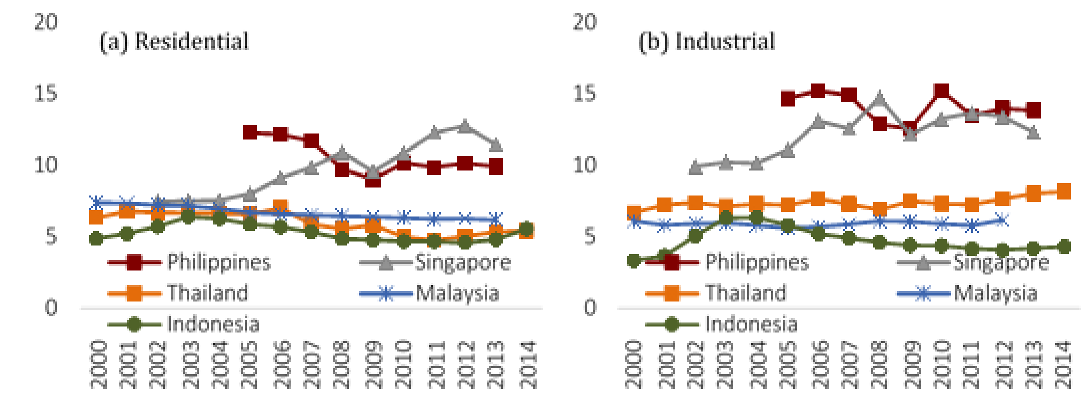
[7] The Writ of Kalikasan is an order of the court temporarily restraining a business or action that may have adverse consequences to the environment. The Writ of Kalikasan issued in 2015 against a coal-fired electricity plant in Subic Bay was subsequently withdrawn.
[8] Since 2008, Singaporeans have paid higher for residential electricity than Filipinos.
[9] The 16th Congress was from July 1, 2013 to June 30, 2016.
[10] See the SB No. 2714 in the 16th Congress. The information on values is applicable to February 2015.
[11] See the HB No. 1625 in the 16th Congress.

attracted the lowest level of net foreign direct investments inflows. Prospective foreign investors find doing business in other countries more profitable (Enerdata, 2014; Flatplanet, 2014).[12]

**Figure 1. Electricity Tariffs in Selected ASEAN Countries, 2000 to 2014 (US cents/ kwh)**




Source: Enerdata, n.d. "Energy Data" Source: Enerdata, n.d. "Energy Data"

The problem can also help explain why the rate of gross fixed capital formation in the country is several notches below those in the ASEAN. In turn, low levels of investments are inadequate to absorb the estimated 1.15 million Filipinos who join the work force each year. According to the World Bank (2013), only about 240,000 of these may find jobs in the domestic formal sector. The rest may likely go overseas (200,000), join the informal labor sector with low productivity and compensation (650,000) and the rest (60,000) are likely to be unemployed.

Throughout ASEAN in 2014, the Philippines' electricity rates came out third after Singapore and Cambodia (Figure 2). Cambodia's electricity tariffs exceed significantly those of neighboring Lao PDR and Thailand.[13] Brunei Darussalam and Myanmar had among the lowest prices in ASEAN, at 5 cents per kwh in 2014.

According to Del Mundo (2015), the problem does persist even if one accounts for the varying taxes and subsidies on the use or supply of electricity in ASEAN 5. Some member states subsidize electricity use, while others, like the Philippines, tax them. The author reported that the country continues to have the most expensive electricity after taxes and subsidies in the ASEAN, with the exception of Singapore for industrial tariffs (Table 1).

The first set of rows of the Table shows the increase in prices of electricity that is explained by tax policies. While it appears that Indonesia has the highest tax rates on industrial use of electricity in the ASEAN 5, the Philippines has the highest increases in prices due to taxes on use. But the low percentage increases of Malaysia, Thailand may just indicate that these countries subsidize their electricity, and thus, imposing taxes blunt the increase of prices in these countries in both residential

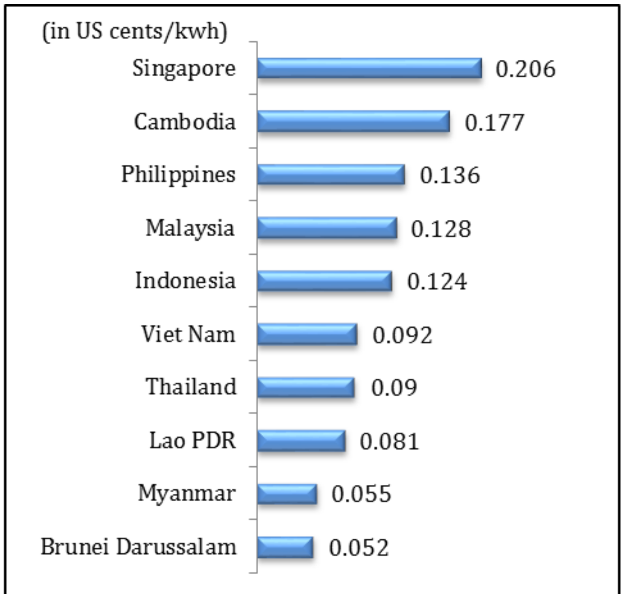
[12] Foreign equity ceilings in direct investments are mandated in the constitution would be among the other reasons for low direct investments of foreigners in the Philippines. See for example Laura Diaconu (Maxim), 2014 and Forbes and Grino, 2008.

[13] According to former DOE Secretary Raphael Perpetuo Lotilla, the country's industry is oil-based. It is a puzzle why Cambodia does not import electricity from neighboring Lao PDR, which is a relatively large producer and exporter of hydro-electricity. This may possibly be traced to inadequate transmission infrastructure capacity. Lately, the Chinese had financed the construction of a hydroelectric plant in Cambodia according to a former Cambodian government official.

and industrial use. Even Indonesia appears to heavily subsidize its residential electricity users. Its increase of residential electricity price is only slightly above a fourth of that of that of the Philippines.

In the second set of rows, the user prices stripped of taxes and subsidies in ASEAN 5 states are compared to that of the Philippines. Except for Singapore in the case of industrial electricity prices, the Philippines is at the top of the list. It is apparent from these comparative results that electricity prices in most of the other ASEAN countries are low compared to those in the Philippines because of factors other than taxes and subsidies. One has to look into generation and transmission cost or the relative scarcity rents[14] that get added to the price simply because the expansion of electricity generation capacity lags the rate of growth of demand for electricity due to economic growth and urbanization rates.

**Figure 2. ASEAN Electricity Tariffs, 2014**



Source: Suryadi,, B. (2014)

Tax measures, like the VAT, aggravates the effect of whatever account for the difference in electricity prices between the Philippines and its neighbors. Moreover, the former does not subsidize electricity use, which could have lowered the electricity tariffs to users or at least offset the effect of taxes on prices. Del Mundo (2015) observed that, in the ASEAN, the Philippines' tax net of subsidy regime on electricity is most burdensome to residential users, and second most onerous after Indonesia to business establishments.

In the remaining parts of this section, the discussion zeroes in on the value added tax and delays in the commencement of electricity generation businesses.

**VAT as a Determinant of the Price of Electricity**

The government has apparently collected a significant amount of revenues from the VAT on electricity. Using as estimate Meralco customers' electricity payments in 2006 and 2007, the VAT on electricity translated to PhP .7 per kwh.[15] On a base of about 51 billion kwh each year, this implies that the yield of the VAT on electricity was at PhP 34 to 37 billion. The Senate version had a lower estimated tax yield, and this may be so as it applied to the entire country and not merely the Meralco franchise area. It estimated that the VAT on electricity brought the government about PhP 25 to 27 billion--a significant amount.

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[14] Del Mundo (2015) did not account for scarcity rent. That is, besides taxes, Philippine prices may have just gone up because of relative scarcity.

[15] See the foreword of HB No. 1625.

**Table 1. Increase of Electricity Tariffs Due to Taxes and Estimated Pre-Tax Electricity Tariffs (%), selected ASEAN member states and use**

| Customer Type | Philippines | Singapore | Indonesia | Malaysia | Thailand |
|---|---|---|---|---|---|
| Increase in Electricity Tariffs Due to Taxes (%) | | | | | |
| Residential | 9.24 | 6.98 | 2.53 | 5.89 | 6.96 |
| Commercial | 9.10 | 7.03 | 12.50 | 5.64 | 7.02 |
| LV Industrial | 7.63 | 6.99 | 12.59 | 5.93 | 6.95 |
| HV Industrial | 8.81 | 7.01 | 12.44 | 6.02 | 7.07 |
| Price of Electricity Before Taxes and Subsidies Relative to the Philippines (%) | | | | | |
| Residential | 100 | 99.85 | 41.92 | 39.11 | 68.68 |
| Commercial | 100 | 96.67 | 85.89 | 68.50 | 76.84 |
| LV Industrial | 100 | 114.98 | 86.52 | 74.78 | 91.38 |
| HV Industrial | 100 | 104.08 | 77.30 | 68.61 | 85.24 |

Source: del Mundo (2015)

**Table 2. Estimated Revenues of the VAT on Electricity Use, 2006 to 2014**

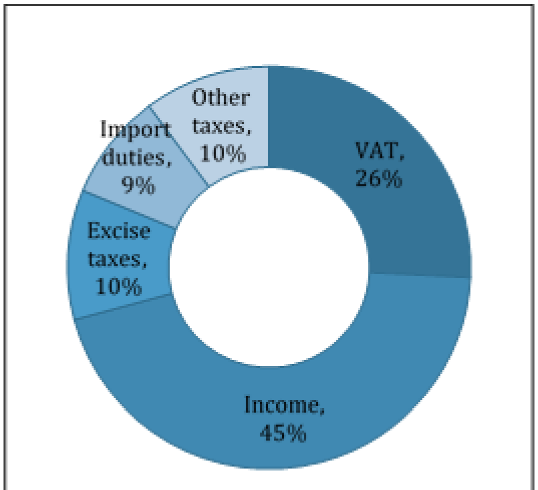
| Year | Tariff (USD/kwh)[1] | Market exchange rate (PhP/USD)[2] | Electricity Use (Mln kwh)[3] | VAT Yield (Mln PhP)[4] |
|---|---|---|---|---|
| 2006 | 0.16626 | 46.15 | 48,467 | 39,842.69 |
| 2007 | 0.16767 | 44.32 | 52,941 | 42,153.40 |
| 2008 | 0.15900 | 47.68 | 55,957 | 45,450.72 |
| 2009 | 0.15745 | 45.11 | 56,568 | 43,046.94 |
| 2010 | 0.18430 | 43.31 | 56,784 | 48,567.37 |
| 2011 | 0.18898 | 42.23 | 59,612 | 50,969.96 |
| 2012 | 0.19943 | 42.45 | 60,821 | 55,163.53 |
| 2013 | 0.19831 | 44.40 | 61,934 | 58,421.27 |
| 2014 | 0.19776 | 45.50 | 67,743 | 65,313.45 |
| Average | | | | 49,881.04 |

[1] Meralco, as gathered by EPDP.
[2] World Bank's World Development Indicators.
[3] Philippine's Department of Energy.
[4] $(Col.B * Col.C * Col.D)\frac{0.12}{1.12}$

This research estimates that the average annual yield of the VAT on electricity is nearly PhP 50 billion from 2006 to 2014 (Table 2).[16] In 2014, the estimated yield reached PhP 65.3 billion based on a national electricity use of 67.7 billion kwh. The electricity tariffs used were obtained from Meralco, as reported by the EPDP. Generation companies would have to declare the input VAT on their intermediate inputs, reducing the take home VAT revenues on electricity use.

In order to obtain revenues to pay for public spending programs prompts policy makers to leave the VAT on electricity as it is. Non-tax revenues in 2012 were only 1.1% of GDP, compared to 13.1% for tax measures. The highest share of non-tax income occurred in 2007 at 3%. The VAT accounts on average over the last decade for about a fourth of all tax income of the government, which in turn accounted for 93% of its total income in 2012. In Figure 3, income taxes were on average 45% of all tax revenues. The VAT comes in second with 26%; excise taxes with 10%; import duties a close fourth with 9% and the remaining 10% of tax take was accounted for on average from 2000 to 2010 by other taxes.

**Figure 3. Average Shares in Tax Collection, by measure, Philippines, 2000-2010**




Source: Paul, J. (2012)

The argument for continuing to impose the VAT on electricity use is compelling considering that it is relatively easy to administer. With few sellers or distribution companies, the administrative collection cost can be relatively low. The tax is a pass through charge, and companies serve as collection agents of the Bureau of Internal Revenue (BIR). With inelastic demand for electricity, lowering the tax rate on the VAT or lifting the VAT altogether implies revenue losses.

Senate Bill (SB) 2714 in the 16th Congress proposes the removal of the 12% VAT on the following electricity-related services: sales of electricity by generation, transmission and distribution companies; services of franchise grantees or electric utilities; sale or importation of machineries and equipment including spare parts to be directly used by the buyer or importer in the generation, transmission and distribution of electricity.

House Bill (HB) 1625 also in the 16th Congress zero-rated the VAT on all generation of electricity in the country regardless of source, not just those that are environmentally-sustainable sources of energy. Zero-rating under the VAT system entitles the generation company to claim input VAT on its intermediate purchases. However, like the SB 2714, it exempted from VAT the services on transmission and distribution of electricity regardless of consumption or customer class. In contrast to its Senate counterpart, HB 1625 excluded the sales of services of franchise grantees or electric utilities.

[16] This is a statutory approach to estimating the revenues. A more precise accounting of the revenue a tax measure yields involves the use of a model of the tax base and market behavior of taxpayers in response to the tax. Later in this study, the actual revenue of the VAT on electricity is actually much lower than PHP 49.8 billion. Instead of the statutory rate of 12%, the effective rate is 3.84% to account for it being effectively a tax on value added (i.e. output vat less input vat) and the inefficiency in tax collection.

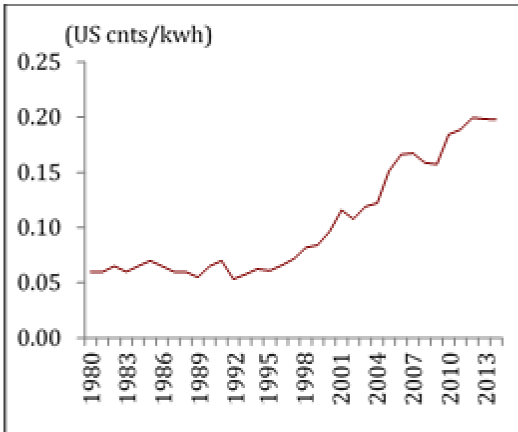
The equivalence of the House and Senate bills is not apparent. Exemption of generation sales from the VAT removes the company's business from the VAT system. The advantage of zero rating, which entitles the taxpayer to claim input VAT on input purchases including spare parts, machineries and equipment, is nullified by the Senate bill's exemption from the VAT of purchases of machineries and equipment--thereby making the two versions equivalent. However, the Senate bill covers not just the generation companies as in the House Bill but also the transmission and distribution companies. Another difference is that the House Bill is silent about the services of the franchise grantees and electric utilities. In the Senate version, the services of these companies are exempted from the VAT.[17]

Those advocating for the lifting of the VAT on electricity claim that the revenue loss may be at least made up for by the expected increase in tax collection resulting from an increased tax base. Electricity is a critical intermediate input in practically all production activities of the economy. Lifting its VAT will reduce the price of electricity, promote economic activities elsewhere and expand the economic base of other tax measures. A consumption tax, the VAT is applied to all transactions except that of primary agriculture. There are also excise taxes and other percentage taxes. Lifting the VAT will stimulate economic activities and thus, the bases of the other indirect taxes. Besides the direct effect on revenues of removing the VAT on electricity, holding other taxes the same, it looks at the indirect effects on revenues induced by the economy-wide expansion of economic activity induced by the removal of the VAT on electricity and the lower price of electricity. The economy loses revenue in the electricity sector, but may at least be mitigated by revenue gains elsewhere in the economy.[18]

Since the 1990s, electricity prices in the Philippines have steadily risen (Figure 4), even before RA 9335 imposed the VAT on electricity in 2005. Starting in the 1990s, prices were on a sustained upward trajectory. The World Bank (1993) noted that in the 1980s, dependable generation capacity already lagged behind projected demand for electricity. The government mothballed the nuclear plant in Bataan, which could have added 620 megawatts to the Luzon grid in the middle of the 1980s. Moreover, the political and economic crises in the middle of the 1980s weakened the government's capacity to establish new electricity generation plants, set up transmission facilities and to undertake other tasks to ensure stable and affordable prices of electricity (Cham, 2007). If prices were stable in the 1980s, the lack of extreme price volatility reflected electricity price regulation in those years. However, the adjustments to the problem of a deficit in supply showed up in users having to cope with increased frequency of power outages in the late 1980s and early 1990s.

[17] Another bill in the 16th Congress is House Bill 344, authored by Reps. Neri Javier Colminares and Carlos Isagani T. Zarate also calls for the lifting of the VAT on electricity. This version is closer to the SB 2714 by Senator Sergio Osmena III.
[18] There is of course the argument that the other taxes may be more difficult to collect, e.g. direct taxes, such that even if the economy expands the government gains less than the potential revenues due to higher collection cost of other tax measures.

**Figure 4. Electricity Prices in the Philippines, 1980 to 2014**




Source: 1980-1991, Aldaba (2004) 1992-2014, Meralco as gathered by EPDP

The Ramos government addressed the electricity power crisis in the late 1980s and early 1990s with new generation capacities from independent power producers (Aldaba, 2004). Total investments in ten years ending in 1998 reached USD6 billion, adding 4,800 MW in new generation capacity to the country's electricity supply, most of which were set up in Luzon (KPMG, 2013). But the solution turned out to be costly for the government. The National Power Corporation (NPC) locked itself in contracts, which led to the accumulation of massive debt in the 1990s. The overly generous incentives given by the Ramos government to IPPs in the 1990s to convince them invest in new capacities, including those for the expensive floating electricity barges, generated not only electricity but also stranded costs, which were passed on to customers in the 2000s under the Electric Power Industry Reform Act of 2001 (EPIRA)[19]

With the marginalization of the NPC in the 1990s, the policy landscape started to shift gradually to market pricing of electricity. Aldaba referred to the industry as "de-facto deregulated sector (in which private power producers can supply electricity directly to distributors and large industrial users)".

The price increase of electricity in the 1990s and the first half of the 2000s pre-dated the imposition of the VAT on electricity (Figure 4). Other factors had caused electricity tariffs to increase then. Although the VAT may have aggravated the problem since the middle of the 2000s, getting rid of VAT can likely at best dampen price increases of electricity. Even with private investments in new capacity coming in, the growth of the electricity supply apparently failed to catch up with demand, giving prices a continuous upward push (Figure 4), even without the VAT on electricity.

The trend towards market pricing got a boost with the second-wave of reforms under the EPIRA[20]. The price at which generation firms offered to sell electricity to distributors, retailers or industrial users became deregulated. The ERC, however, needed to grant a license to power producers to sell to end users, except to those that had already been granted a franchise from Congress (Aldaba, 2004). Generated electricity prices continued to rise, once again reflecting the lag in supply relative to demand.[21]

The VAT came into play in the electricity market in 2005. Its effect on electricity prices was masked by the decline of prices due to the global economic crisis in 2008 (Figure 4). However, it could not have caused prices to rise since the 1990s. A more fundamental explanation is that supply has lagged behind demand. The business of generating electricity is relatively capital-intensive with increasing returns to investments. Had there not been the lack of delays in getting new entrants to participate in the industry and other policy distortions been corrected, scarcities in capacity would have been prevented from being fully reflected in the prices received by the independent power producers.

[19] This is Republic Act No. 9136, which was enacted in 2001. Stranded costs are passed on to consumers via the *universal charge*.
[20] Republic Act No. 9136,
[21] However, retail prices by distributors remained regulated by the Energy Regulatory Commission since these are considered natural monopolies.

**The Extraordinary Costs of Doing Business**

The ERC is tasked to provide the certificate of compliance to a potential new power producer. According to Rood (2015), the Department of Energy in 2015 estimated that "165 signatures" are needed to secure such a license to operate a power generation facility. The entire process takes a "minimum of three years".

Navarro and Escresa (2016) described the permitting process as meeting four objectives, namely: economic and regulatory; social; environment and resource regulation; and technical and other related regulations. Table 3 defines each of these objectives. In a nutshell, in order for ERC to be able to give the compliance certificate to a generation company to operate its business, all the other objectives need to be met and the approvals granted by other agencies in government. Table 4 details the permits that ERC needs to review before providing the overall compliance certificate that the EPIRA requires.

**Table 3. Intended Objectives of the Business Permitting Process for Power Generation Companies**

| Classification | Definition | Examples |
|---|---|---|
| Economic and regulatory | Economic regulation and the provision of economic incentives appropriate for the specific characteristics of the power generation sector | Power Supply Agreement (PSA) approval by ERC; Investment incentives from DTI, FIT |
| Social | Social net social benefits of the construction of a power plant may be positive, the social cost may be distributed asymmetrically across groups | Permits from barangay officials and other LGUs, FPIC |
| Environment and resource regulation | Need to optimize the use of natural resources and regulate the quality of the environment across time, between present and its future uses | Environmental Compliance Certificate from DENR; water permit from NWRB |
| Technical and other related regulations | Set of permits related to the specific and technical characteristics of electricity as a good | GIS review by the NGCP; feasibility study review by the DOE |

Source: Navarro, A. and L. Escresa (2016)

In Table 4, Navarro and Escresa (2015) organize the different types of permits by stages of setting up the business using a hydro-electric power project to illustrate how complex the permitting process has become. In some of these, the authors had provided estimates based on their interviews regarding the duration required to process each of them. But there are permits whose duration in processing remains unknown. As presented in the Table, there is a total of 48 permits required to get a hydro-power business started and it takes at least 1,351 days or 3.7 years to comply with all required permits. The duration could be longer as there are permits that take up an undeterminable amount of time to process. Table 5 shows that the duration to process the permits in slightly over two-thirds of the 48 permits required is unknown.

**Table 4. Number of Permits of an Illustrative Hydro-Power Project and Estimated Time to Comply (in days)**

| Stage of Business Set Up | Permit | Regulatory Agency | Time to Process the Permit |
|---|---|---|---|
| Registration | Certificate of Endorsement | Department of Energy (DOE) | 3 |
| | Corporate or Partnership Registration | Securities and Exchange Commission (SEC) | 7 |
| | Fire Safety Insurance Certificate | Bureau of Fire Protection (BFP) | 5 |
| | Barangay Clearance | Local government unit (LGU) | ? |
| | Mayor's Business Permit | LGU | ? |
| | Tax Identification Number | Bureau of Internal Revenue (BIR) | 7 |
| | Employer Registration | Social Security System (SSS) | 3 |
| | Member Registration | Home Mutual Development Fund (HMDF) | 0.125 |
| Sub-total | | | 25 |
| Pre-development | Registration and Renewable Energy Service Contract | DOE | 45 |
| | Local Government Unit (LGU) Endorsement | LGUs | ? |
| | Free and Prior Informed Consent | National Commission for Indigenous Peoples (NCIP) | ? |
| | Certificate of Precondition and/or Certificate of Non-overlap | NCIP | ? |
| | Environmental Compliance Certificate | Department of Environment and Natural Resources' Environmental Management Bureau (DENR-EMB) | ? |
| | Foreshore Lease Contract | DENR-City Environment and Natural Resources Office (CENRO) | ? |
| | Special Land Use Permits | DENR-Forest Management Bureau (FMB) | 66 |

| Stage of Business Set Up | Permit | Regulatory Agency | Time to Process the Permit |
|---|---|---|---|
| | Tree Balling Permit | DENR-FMB | ? |
| | Tree Cutting permit | DENR-FMB | ? |
| | Permit to Operate Wastewater Plant | DENR | ? |
| | Permit to Operate Air Pollution Control Installation | DENR-EMB | ? |
| | Wastewater Discharge Permit | DENR-CENRO | 30 |
| | Land Use Conversion Permit | Department of Agrarian Reform (DAR) | 180 |
| | Exemption from CARP Coverage | DAR | ? |
| | Certificate of Water Availability | National Water Regulatory Board (NWRB) | ? |
| | Conditional Water Permit and/or Water Permit | NWRB | ? |
| | Certificate of Endorsement | DOE for Board of Investments (BOI) | 110 |
| | Project Registration for Incentives | BOI | 45 |
| | Conduct/Approval of the Grid Impact Study | Investor Firm/National Grid Corporation of the Philippines (NGCP) | 730 |
| | Right of Way Clearance | NGCP | ? |
| | Transmission Clearance | NGCP | ? |
| | Certificate of Registration | Bureau of Customs (BOC) | ? |
| | Customs Clearance for Importation | BOC | ? |
| | Alien Certificate of Registration Identity Card | Bureau of Immigration (BI) | ? |
| | Permit to Operate Steam Turbine | Department of Labor and Employment (DOLE) | ? |
| | Material License | Philippine Nuclear Research Institute (PNRI) | ? |
| | Special Investors' Visa | BI | ? |
| | Permit to Operate Elevator/Dumbwaiter | DOLE | ? |

| Stage of Business Set Up | Permit | Regulatory Agency | Time to Process the Permit |
|---|---|---|---|
| | Permit to Operate Boiler | DOLE | ? |
| | Philippine Visa | BI | ? |
| | Special Work Permit | BI | ? |
| | Alien Employment Permit | DOLE | ? |
| Sub-total | | | 1,206 |
| Development | Certificate of FIT Eligibility | DOE | ? |
| | Certificate of Commerciality | DOE | ? |
| | Conversion for RE contract to Development/Commercial | DOE for BOI | ? |
| | Connection Permit | NGCP | ? |
| | Confirmation of Electro-mechanical Completion | DOE | 30 |
| | Application for Feed-in Tariff/FIT | Energy Regulatory Commission (ERC) | ? |
| | Application for approval of Power Supply Agreement | ERC | 90 |
| | Certificate of Compliance | ERC | ? |
| Sub-total | | | 120 |
| Total | | | 1,351 |

Source: Navarro, A. and L. Escresa (2015)

**Table 5. Number of Permits Required and Estimated Duration to Process Permits for an Illustrative Hydro-Power Plant, by stage of business set up**

| Stage of Business Set Up | Number of Permits | Number of Permits with Known Duration | Number of Permits with Unknown Duration | Duration of Processing the Permits (days) |
|---|---|---|---|---|
| Registration | 8 | 6 | 2 | 25 |
| Pre-development | 32 | 7 | 25 | 1,206 |
| Development | 8 | 2 | 6 | 120 |
| Total | 48 | 15 | 33 | 1,351 |

Source of data: Table 4

The permit with the longest processing time is the approval of the grid impact study, which requires the investor proposing where to locate the generation plant and specifying how the electricity produced by it will be transmitted through the country's electricity grids. The approval process requires a total of 2 years. According to the authors, the capacity of the National Grid Corporation of the Philippines (NGCP) tends to slow down this process. It is not uncommon that the investor conducts the grid impact study to hasten the process but then the NGCP must review and approve the study. It is an important milestone, as 54% of the entire duration of the permitting processes comes from conducting this study and having the transmission plan approved by the NGCP.

The problem reflects the lack of coordination among the agencies tasked to regulate or oversee the development of the industry. One face of it is the chicken-egg problem--but this is where the doctors themselves may also be sick of a lack of coordination: the other face of the problem.

None among these agencies is mandated to decide where the country's electricity grid network would have to be run from one part of the country to another. Before the EPIRA, the National Power Corporation was assigned this task. However, when the law organized the industry to become more market-oriented, no agency was tasked to take on this part of the work of the NPC. While the NGCP decides on the level of transmission capacity, its plan as provider of transmission services is not coordinated with the autonomous decisions of independent power producers who decide where to locate their respective electricity generation plants. Their decision where to locate is dictated by the relative abundance of raw materials for renewable energy in a given locality, and it may be in an area where the NGCP may not be ready with the grids to then transmit the electricity produced. The surplus electricity produced in the Negros island because of the abundance of bagasse from sugar milling and used as raw material in generating renewable electricity cannot be sold to other parts of the country for lack of transmission facility.

The construction of new electricity generation capacity in Negros had proceeded despite difficulties in disposing of their products in the country's electricity market, and that is because of the abundance of the raw material. But in other situations, such as a hydro-power plant, which requires locating in particular places where water is abundant, the decision to invest in it depends upon the generation company being able to have access to the country's grids to sell its products. Without the transmission facility, the capacity may remain a plan until the NGCP would have invested in the facility. On the other hand, the latter--which is a private company and unregulated except for the service fee that it charges its clients-- may not necessarily find it profitable to invest in a transmission facility to cater to the needs of the prospective hydropower plant. It will also have to look at how the new capacity may impact on the stability of the electricity grids.

**Electricity Generation Capacity Lags**

The amount of red tape involved in getting documents for a new power plant approved has the same effect as delaying the delivery of the desired level of new power generation capacity. At any given time, investors do their calculations of whether the value marginal product of a power plant exceeds its user cost. When they do so at any point in time, they already take into consideration the amount of time needed to build the new power plant including the time needed to comply with obtaining business permits. Given investment lags, i.e. time to build the plant and the lengthy approval system for new power plants, supply of new power generation capacities lag behind the desired. It is as if the growth in the supply of electricity, as determined by the net expansion of generation capacity, is catching up with that of consumption, pushing electricity prices up as in Figure 4.

Table 6 shows the total annual electricity generation capacity of the country since the 1990s. The existing capacity in 2014 was 77,261 gwhs. The Luzon grid system transmitted 73.5% while 14.26% and 12.27% were transmitted by the Visayas and Mindanao grids, respectively. On average, from the 1990s, Luzon's share of total rated capacity was 74.3%; Visayas, 12.7% and Mindanao, 13%. The capacity had been growing at the average annual growth of nearly 4.8%. There had been spikes in such growth: in the 1990s, first half of 2000s, and the first half of the current decade.

**Box 1. Red Tape as Investment Lags**

It had been pointed out that investment and capital stock accumulation are two different things (Kalecki, 1935) because of investment lags. Investment, which is putting up the values to make capital stock, which can be productively used in the economy, comes first before the benefits from the new capital are realized. These gestation lags can be explained by the time to build the capital stock typically including electric power plants, (Kydland and Prescott, 1982) or involves delays in the delivery of the capital good (Peeters, 1996). Jorgensen (1963) stated that 'each period new projects are initiated until the backlog of uncompleted projects is equal to the difference between desired stock and actual capital stock.'

The classic capital accumulation equation is that the capital stock in this period, K_t , is equal to that in immediately preceding period, K_(t-1), less depreciation plus new capital stock or current period investment, I_t. This assumes that it only takes one period to transform the values into the incremental capital good.

$$K_t = K_{t-1} - D_{t-1} + I_t \qquad (1)$$

In general as expounded by Kydland and Prescott (1982), the time needed to construct the capital good, say the electric power plant, extends beyond the current period. Thus, the new capital accumulation equation is adjusted to take into account the time to build:

$$K_t = K_{t-1} - D_{t-1} + \sum_{t=1}^{J} \delta_t S_{J,t} \qquad (2)$$

The values put up to produce the desired new capital stock are distributed through the horizon it takes to construct the capital asset, which in the equation above is $J$ time periods. That is, it takes $J$ years to complete the construction of the plant. The stream of investments, $S_{J,t}$, sums up to $I_t$ , which makes up the desired capacity in $J$ time periods, the $\delta$'s, all fractions and sum up to 1. If $J$ is one year, then $\delta = 1$, and $S_{1,t} = I_t$, and it reduces to equation 1. This accumulation process of capital stock is called the 'time to build' gestation lag of investments.

The investment plan, $I_t = \sum_{t=1}^{J} \delta_t S_{J,t}$ , is assumed fixed. But Park (1984) introduced a flexible investment plan version of it as follows

$$I_t = \sum_{t=1}^{J} \delta_t S_{J,t} + \Delta_{J,t} \qquad (3)$$

This may apply to companies like the RP Energy, which in this case Δ is negative.[1]

Peeters (1996) raised another type of gestation lag of investments, the delay in delivering the capital good. In the following equation, the delay is measured by the lag, , in time periods.

$$K_t = K_{t-1} - D_{t-1} + I_{t-L+1} \qquad (4)$$

If $L$ is equal to 1, i.e. there is no delay, the equation boils down to the first equation above.

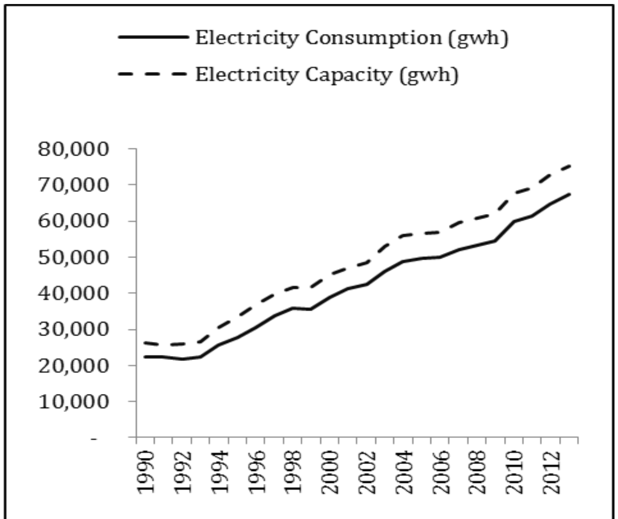
**Red Tape**

The delivery lag may be interpreted as also the effect of red tape investors have to go through to get a permit to set up the power plant. In the end, the company has to secure a permit to operate the business. The time it takes to secure all the permits delays the process of adding new capacity into the country's electricity system. There could be an overlap between the time it takes to build the plant and the process of securing the permits.

$$K_t = K_{t-1} - D_{t-1} + \sum_{t=1}^{J} \delta_t S_{J,t-L+1} \qquad (5)$$

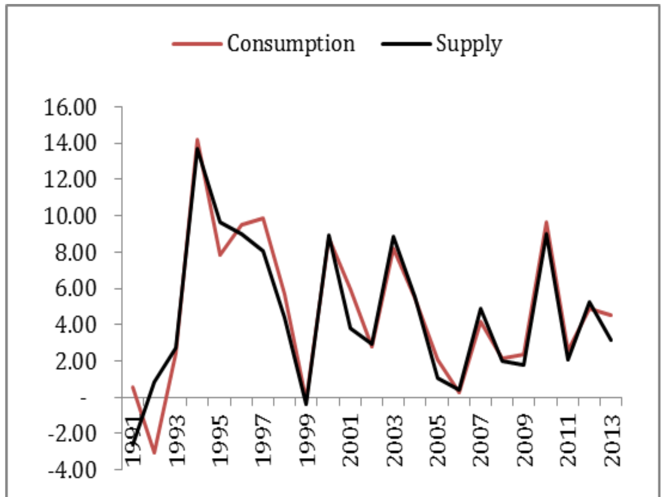
If it takes $L$ periods to go through the permitting process, which in previous section above, was estimated to be more than 3 years for an illustrative hydro-power plant, but then it takes 4 years to construct the plant, $J = 4$, then the binding investment lag would be the time to build rather than the red tape.[1] However, if $L > J$, red tape becomes the bottleneck. If the power plant would already be operational in $J$ years, red tape delays the availing of the benefit in having the added power plant in the country's electricity system.

**Figure 5. Electricity Generation Capacity and Use, Philippines, 1990 to 2013**




Source: See Table 7

**Figure 6. Growth of Electricity Consumption and Generation Capacity, Philippines, 1991 to 2013**




Source: See Table 6 for supply, and Table 7 for consuption

Table 7 presents the annual electricity use in the Philippines from 1990 to 2013. The data on consumption was obtained from the World Bank's World Development Indicators database, which has information on both the per capita electricity use and population of the country. The data is compared with the electricity supply, which was obtained from the Department of Energy. Electricity use in all years is below that of supply. There is rated capacity that remains unused or perhaps used as reserves. The excess capacity tends to be, on average, 16% of electricity use.

Figure 5 shows the plots of both consumption and supply. It appears that electricity use and supply are both growing at about the same rate as shown in Figure 6. The growth rates do not indicate that supply of electricity lags behind consumption. The average consumption growth throughout the period is 4.81%, while that of supply is 4.57%, indicating a negligible difference.

But what about the growth rates of electricity use and supply? If investors had determined in any time period to invest in generation, it may be expected that the growth rates of supply and consumption would more or less be equal. In other words, if consumption is growing at the strong positive x percent, investors are likely encouraged to likewise make the investments to increase the supply, with their growth rates convergent. If there is any lag due to time to build or red tape in plant approvals, then the growth rate of supply may lag behind that of consumption.

However, the pattern shown in Figure 6 may indicates that electricity use in the country is constrained by the available capacity. If electricity requirement of faster economic growth outpaces the expansion of supply of electricity, the economy may simply go into virtual equilibrium. With regulated retail prices, users would have to pay the same regulated price, but cut back on their demand because of power outages. While paying what appear to be affordable electricity tariffs, users would still have to bear the high cost of electricity due to scarcity, not in terms of the price but in terms of the opportunity cost of business forgone due to lack of electricity, or the inconvenience on the part of residential users. Accordingly, the growth of the economy would have to taper off, constrained by the economy’s important input, electricity.

**Table 6. Electricity Generation Capacity in the Philippines, by Grid, 1990-2014**

| Year | Luzon (gwh) | Visayas | Mindanao | Total | Luzon (%) | Visayas | Mindanao | Total |
|---|---|---|---|---|---|---|---|---|
| 1991 | 19,511 | 2,376 | 3,673 | 25,649 | 76.33 | 9.30 | 14.37 | 100.00 |
| 1992 | 19,967 | 2,566 | 3,337 | 25,870 | 77.18 | 9.92 | 12.90 | 100.00 |
| 1993 | 19,902 | 2,813 | 3,864 | 26,579 | 74.88 | 10.58 | 14.54 | 100.00 |
| 1994 | 23,290 | 3,036 | 4,133 | 30,459 | 76.46 | 9.97 | 13.57 | 100.00 |
| 1995 | 25,208 | 3,652 | 4,695 | 33,554 | 75.12 | 10.88 | 13.99 | 100.00 |
| 1996 | 27,688 | 3,991 | 5,029 | 36,708 | 75.43 | 10.87 | 13.70 | 100.00 |
| 1997 | 30,084 | 4,347 | 5,365 | 39,797 | 75.60 | 10.92 | 13.48 | 100.00 |
| 1998 | 31,755 | 4,481 | 5,343 | 41,578 | 76.37 | 10.78 | 12.85 | 100.00 |
| 1999 | 31,745 | 3,331 | 5,245 | 41,432 | 78.73 | 8.26 | 13.01 | 100.00 |
| 2000 | 34,679 | 5,147 | 5,464 | 45,290 | 76.57 | 11.36 | 12.06 | 100.00 |
| 2001 | 36,184 | 5,163 | 5,703 | 47,049 | 76.91 | 10.97 | 12.12 | 100.00 |
| 2002 | 36,387 | 6,099 | 5,952 | 48,467 | 75.12 | 12.59 | 12.29 | 100.00 |
| 2003 | 37,535 | 8,842 | 6,564 | 52,941 | 70.90 | 16.70 | 12.40 | 100.00 |
| 2004 | 39,854 | 9,016 | 7,087 | 55,957 | 71.22 | 16.11 | 12.67 | 100.00 |
| 2005 | 40,627 | 8,698 | 7,243 | 56,568 | 71.82 | 15.38 | 12.80 | 100.00 |
| 2006 | 41,241 | 8,129 | 7,890 | 56,784 | 72.02 | 14.20 | 13.78 | 100.00 |
| 2007 | 43,260 | 8,102 | 7,890 | 59,612 | 73.01 | 13.67 | 13.32 | 100.00 |
| 2008 | 44,200 | 8,650 | 7,972 | 60,821 | 72.67 | 14.22 | 13.11 | 100.00 |
| 2009 | 44,972 | 8,724 | 8,235 | 61,934 | 72.62 | 14.09 | 13.30 | 100.00 |
| 2010 | 50,250 | 9,075 | 8,403 | 67,743 | 74.19 | 13.40 | 12.41 | 100.00 |
| 2011 | 49,974 | 10,456 | 8,703 | 69,132 | 72.29 | 15.12 | 12.59 | 100.00 |
| 2012 | 52,276 | 11,493 | 9,127 | 72,885 | 71.71 | 15.77 | 12.52 | 100.00 |
| 2013 | 54,820 | 11,100 | 9,347 | 75,266 | 72.83 | 14.75 | 12.42 | 100.00 |
| 2014 | 56,766 | 11,014 | 9,481 | 77,261 | 73.47 | 14.26 | 12.27 | 100.00 |
| Average | | | | | 74.31 | 12.67 | 13.02 | |

Source: Department of Energy

**Table 7. Electricity Consumption and Supply, Philippines, 1990 to 2013**

| Year | Per Capita Electricity Use (kwh) | Population | Consumption (gwh) | Supply (gwh) |
|---|---|---|---|---|
| 1990 | 360.74 | 61947340 | 22,347 | 26,327 |
| 1991 | 353.85 | 63509940 | 22,473 | 25,649 |
| 1992 | 334.96 | 65078901 | 21,799 | 25,870 |
| 1993 | 335.17 | 66654954 | 22,341 | 26,579 |
| 1994 | 377.15 | 68240134 | 25,737 | 30,471 |
| 1995 | 398.52 | 69835713 | 27,831 | 33,566 |
| 1996 | 428.33 | 71437381 | 30,599 | 36,727 |
| 1997 | 462.20 | 73042605 | 33,760 | 39,797 |
| 1998 | 478.58 | 74656228 | 35,729 | 41,578 |

| | | | | |
|---|---|---|---|---|
| 1999 | 467.69 | 76285225 | 35,678 | 41,432 |
| 2000 | 499.73 | 77932247 | 38,945 | 45,290 |
| 2001 | 519.28 | 79604541 | 41,337 | 47,050 |
| 2002 | 522.75 | 81294378 | 42,497 | 48,467 |
| 2003 | 555.97 | 82971734 | 46,130 | 52,940 |
| 2004 | 576.03 | 84596249 | 48,730 | 55,957 |
| 2005 | 577.54 | 86141373 | 49,750 | 56,567 |
| 2006 | 569.66 | 87592899 | 49,898 | 56,783 |
| 2007 | 584.53 | 88965508 | 52,003 | 59,611 |
| 2008 | 588.51 | 90297115 | 53,141 | 60,821 |
| 2009 | 593.86 | 91641881 | 54,422 | 61,921 |
| 2010 | 644.27 | 93038902 | 59,942 | 67,742 |
| 2011 | 650.74 | 94501233 | 61,496 | 69,176 |
| 2012 | 672.39 | 96017322 | 64,561 | 72,921 |
| 2013 | 692.06 | 97571676 | 67,525 | 75,266 |

Source: World Bank's World Development Indicators for electricity use; Table 6 for supply

In the generation sector of the electric power industry, where stakeholders are increasingly using competitive markets in availing electricity, prices between producers on one side of the market and distribution firms, electric cooperatives or institutional users on the other, increase to signal the need for more capacity. This may explain why prices of electricity at this level of the industry had steadily risen since the 1990s, as Figure 4 had shown.

In the following, we use the general equilibrium model of the Philippine economy to explore the implications of the value added tax and red tape.

*Regulatory Risk*

Besides red tape, potential investors in generation capacity have to contend with regulatory risk. Rules or laws may change after projects have been started. This happened in the case of the Redondo Peninsula (RP) Energy, a joint venture of Meralco PowerGen Corp (MGen), Aboitiz Power Corporation and Taiwan Cogeneration International Corporation. Designed at the start to be a 600 MW coal power plant, the high court slapped a Writ of Kalikasan sought for by civil society groups opposed to the coal plant. Eventually, the court upheld the original approvals granted by the likes of the SBMA. Already delayed for about a year to comply with the Writ, longer delay is expected as its owners decided to reconfigure the capacity of the plant.

A few government officials and agencies have advocated either the termination of coal plants or not starting new ones. This is so, despite the fact that presently, the relative prices of alternative sources of electricity point to further expansion of coal generation, even after accounting for pollution costs. In May 2016, the Climate Change Commission asked the Department of Environment and Natural Resources and other agencies to conduct a review of the 29 coal power plants that had been approved by the previous government (Romero, 2016). The review of the approvals for these plants, targeted to be done in six months, aims to “accelerate and prioritize renewable energy development, enhance energy efficiency and conservation and ensure clean, affordable and reliable energy for the whole country.” The high transactions cost discourages private sector investments in the most economically sensible and dependable source of electricity. Taxing emissions of coal-fired plants rather than prohibiting their entry into the market is the better approach to aligning investor incentives with social welfare (Ravago and Roumasset, 2016; and Alonzo and Guanzon, 2016).

## 3. Model Structure and Calibration of Its Key Parameters

The research set up a dynamic computable general equilibrium (CGE) model of the Philippine economy. This model is used to account for the many interactions of variables in the economy. It should be noted that the electric power industry is not as perfectly competitive as other scenarios that the CGE model ordinarily is designed to capture. However, the rest of the economy that makes use of electricity as an intermediate input can be described as comprising industries with business firms competing with each other to offer the most competitive price, and on the demand side, consumers who take the prices offered by the market as given.

Besides, while the nature of electricity generation is that it is capital intensive and exhibits declining costs to scale, the EPIRA reforms have moved the industry from what used to be a monopoly under the NPC to increasingly market-oriented. The reforms started with making electricity generation contestable, and progressively, the distribution part of it. Competition increasingly marks the interaction among industry players and users. Regulation of electricity rates is noted but this study attempts to explain wholesale electricity prices at the generation level. There are distortions in the industry, such as the VAT on electricity and red tape. The model is used to differentiate how prices of electricity change if the VAT on electricity is lifted or the red tape in obtaining business permits to start a generation company eliminated, and in turn, how the rest of the economy will be affected by these reforms.

Advocates of lifting the VAT look forward to the immediate relief on prices by its removal. Prices of electricity may fall but likely at less than its statutory rate because electricity demand may be stimulated in the rest of the economy by the lower price of this economy-wide input. It is this type of interaction, which makes the general equilibrium model more useful than a partial equilibrium model of the electricity market in analyzing the economic effects of policy reforms.

Following Goulder and Williams (2003), one of the most useful contributions of GE is determining whether particular taxes such as VAT exacerbate existing taxes thereby implying a (much) larger burden than we would expect from partial equilibrium analysis. Is there some reason to think that these "tax interaction" effects are large or small in the case of VAT? To the extent that electricity prices are already too high because of red tape, departures from completion and other policy distortions, the VAT exacerbates this distortion. That may seem like a good enough reason to lower the VAT... but the sounder policy implication is to get rid of those distortions in the first place. But lifting the VAT so as not to exacerbate a distortion also distorts the tax treatment across industries, generating another one such as the inefficiency of the VAT system with a major industry exempted of it.

The model has 17 industries (including the electricity industry), two factors (labor and capital), three indirect tax measures (the VAT, the import duty and other indirect tax measures) and five income quintile households. The model is calibrated to the national income accounts data in 2009 using the latest input-output table in 2006.

Four levels of simulations were done with the model: the base year level involving both having the VAT and red tape on electricity; the regime with the VAT on electricity use lifted; the scenario where the VAT is in effect and red tape is eliminated and finally, the regime where both the VAT and red tape are removed. The model is solved from 2009 to 2021, with both labor and capital endowments rising at the rate of a percent each year.[22]

[22] The rate is set so as to focus on the effects of the policy changes and avoid any factor-biased growth.

## Effective VAT Rate

Although the statutory VAT rate is 12%, its effective rate may be lower because of inefficiency in tax collection. As in the rest of the VAT-liable businesses in the economy, the VAT is assessed on electricity sales, and the resulting output VAT is reduced by the VAT payments of the taxpayer on the intermediate inputs of the generation company, called the input VAT. The resulting base of the tax is only the value of the primary inputs used in producing electricity.[23] If the collection of the VAT was perfect, the tax collection could reach PHP795.85 billion in 2009. However, actual yield of the VAT was about 31% of potential, which makes this study use 3.84% as its effective VAT on primary factor use.

## Estimated Red Tape Cost

The red tape cost of setting up a power generation business in the Philippines is estimated to comprise the cost of complying with the regulations and the opportunity cost of income forgone by the investor because of the delays. The estimated cost of red tape is about 12% of the cost of capital services used up in producing electricity, i.e. the contribution of capital to the value added in generating electricity. This covers both the start up costs in registering the business, having the required permits approved by the various agencies, which in Table 4 may reach about 3.7 years,--rounded off to 4 years, and the opportunity cost of the value added for 4 years that the investor would have generated had it not been for the delays in getting the permits approved, or the red tape.

In 2009, the World Bank 's World Development indicators for the Philippines estimated that 21.6% of GNI per capita is spent in business start-up procedures. The amount is only about PHP16,501 per application. Clearly, there are other costs associated with complying, e.g. series of meetings, conduct of studies, travel, etc., but this is definitely small relative to the value added forgone.[24]

The estimated time it takes for a hydro-electric power project to go through the permitting process is about 4 years--the longest step being the conduct of the grid impact study. The ERC conducts this study, but nonetheless it is still a required cost, that could be covered by the PHP5 million budget set aside by each firm.

Ascribing value to this time, the value added in 2009 generated by the industry amounted to about PHP214 billion, accounting for both cost of labor and capital services. How many power stations were involved in producing this amount? Table 8 sums up the number of power stations and the capacity of the average power stations, grouped by source. The newer stations are devoted to renewables, but the average capacity of these stations is small compared to those of coal, oil and natural gas. The study estimates the average power station, weighting their respective capacities by their respective shares in the country's total electricity supply.

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[23] In the CGE model, we modeled it to be a tax on primary factor use of all VAT-covered industries in the model.

[24] The cost of about PHP5 million could then be set aside just to meet all these expenses or PHP40 million for all 8 entrants.

**Table 8. Number and Average Capacities of Operating Power Stations in the Philippines, by electricity source**

| Source | Power Stations | Average Capacity (MW) | Average Year of Station Commissioning | Power Stations | Average Capacity (MW) | Average Year of Station Commissioning |
|---|---|---|---|---|---|---|
| | Operating no later than 2015 | | | Operating no later than 2009 | | |
| Geothermal | 20 | 124 | 1995 | 17 | 130 | 1992 |
| Coal-fired | 15 | 459 | 2005 | 7 | 523 | 2000 |
| Solar power | 17 | 28 | 2015 | 1 | 20 | 2015 |
| Biomass | 4 | 22 | 2015 | | | |
| Wind power | 4 | 80 | 2012 | 1 | 33 | 2005 |
| Diesel | 6 | 50 | 1994 | 5 | 58 | 1996 |
| Gas | 3 | 900 | 2000 | 3 | 900 | 2000 |
| Oil | 1 | 540 | 1991 | 1 | 540 | 1991 |
| Hydro-electric | 30 | 68 | 1996 | 17 | 24 | 2010 |
| Total/Weighted Average | 100 | 158 | | 52 | 190 | |

Source of firm-level data: Appendix Table A1.

There were 100 firms operating in 2015, and many of these were involved in renewable energy. In 2009, there were no biomass-based power stations, and only 1 firm each for solar power and wind power. The study selected only those firms that were operating no later than 2009, and they number 52. Forty-eight other firms were either under construction in 2009 or not yet operational. The average capacity of these 52 firms was 190 MW.

With this capacity, the study estimated the number of power plants, which must have applied for permits to start power generation businesses. Since 1991, the incremental rated generation capacity each year up to 2014 using the data in Table 9 ranged from a high of 5,809 MW in 2009 to a low only -1.4 MW in 1999, i.e. there was a net decommissioning of power capacities. The average incremental supply per year was 2,244 MW. It is noted, however, that in the latter years, say from 2009, the average incremental supply was higher at 3,065 MW.

**Table 9. Incremental Supply and Estimated Number of Power Stations Commissioned**

| Year | Total | Incremental Capacity | Number of stations commissioned |
|---|---|---|---|
| 1991 | 25,649 | | |
| 1992 | 25,870 | 221 | 1 |
| 1993 | 26,579 | 709 | 2 |
| 1994 | 30,459 | 3,880 | 13 |
| 1995 | 33,554 | 3,095 | 10 |
| 1996 | 36,708 | 3,154 | 11 |
| 1997 | 39,797 | 3,089 | 10 |
| 1998 | 41,578 | 1,781 | 6 |
| 1999 | 41,432 | -146 | |
| 2000 | 45,290 | 3,858 | 13 |
| 2001 | 47,049 | 1,759 | 6 |
| 2002 | 48,467 | 1,418 | 5 |
| 2003 | 52,941 | 4,474 | 15 |
| 2004 | 55,957 | 3,016 | 10 |
| 2005 | 56,568 | 611 | 2 |
| 2006 | 56,784 | 216 | 1 |
| 2007 | 59,612 | 2,828 | 10 |
| 2008 | 60,821 | 1,209 | 4 |
| 2009 | 61,934 | 1,113 | 4 |
| 2010 | 67,743 | 5,809 | 20 |
| 2011 | 69,176 | 1,433 | 5 |
| 2012 | 72,922 | 3,746 | 13 |
| 2013 | 75,266 | 2,344 | 8 |
| 2014 | 77,261 | 1,995 | 7 |
| Average | | 2,244 | 8 |

Source of Data: Table 6

Each annual incremental capacity was divided by the capacity of the average power station of 190 MW. This implies that on average, about 8 power projects are commissioned each year. This implies that say, four years prior, about the same number of investors applied for permits to start a power generation business.

In 2009, the industry had a total capacity of 61,934 MW (see Table 6) responsible for generating about PHP214 billion of value added. Dividing this by the capacity of the average power station, 190 MW, about 326 power stations could have produced the value added. This implies that each one contributed about PHP0.656 billion to the industry's value added. If each year, as discussed above, an average of 8 power projects go through the permitting process and are delayed for 4 years, then the opportunity cost would be PHP21.006 billion. Adding the 40 million pesos as the start up costs for the 8 applications the total red tape cost is PHP21.046 billion.

In proportion to the value added contribution of capital of about 179.188 billion, the red tape cost is roughly about 12% of the cost of capital services in the electricity business. This is estimate red tape cost is entered into the CGE model in simulating the general equilibrium effects of red tape. This is applied each year since there are 8 expected to apply for permits to operate an electricity power generation business.

## 4. Effects of the VAT and Red Tape

In this section, the study simulates and discusses the effects of the value added tax on electricity and red tape in securing permits to start new power plants using a computable general equilibrium (CGE) model. The economic model has 17 industries, two primary factors--labor and capital--and income quintiles representing the household consumers. The model is based on the latest input output survey of the Philippines in 2006, and was calibrated to replicate economic data in 2009.[25]

The policy simulations are done for 12 years, 2010 up to 2021 and for four policy regimes, with base year being 2009. Each year, the endowment of labor and capital in the model is increased by half of a percent, equally for labor and capital. The resulting new endowment in labor and capital are then distributed proportionately using the observed shares of each household income quintiles in total endowment of resources. How these resources are going to be allocated among the 17 industries of the model depends on the respective factor prices and marginal productivities of these industries.[26]

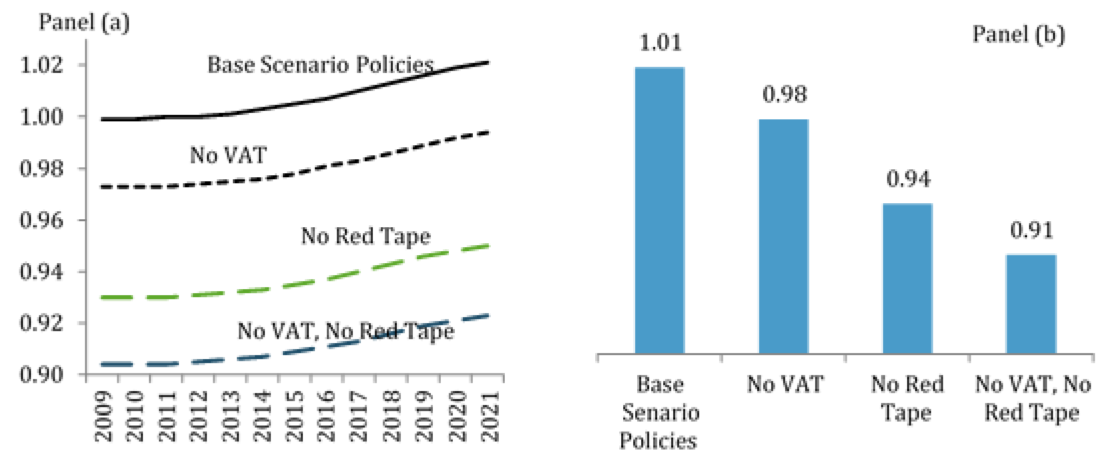
The four policy simulations are described as follows. The base year level simulates the effects of both the VAT and red tape, doing the analysis for 10 years. Three counter-factual simulations are done. One, the VAT on electricity use is lifted, retaining the rest of the indirect taxes in the model. Secondly, red tape is removed by half but retaining the VAT. Thirdly, both the VAT and red tape are removed. In each of these simulations, the study reports out the price of electricity throughout the ten-year simulation period. Other results are going to be taken up including the changes on the welfare of the country's residents, as represented by the income quintile households of the model and an indicator of the overall efficiency of the economy.

### Effects on Electricity Prices

How much lower can electricity prices fall if the value added tax on electricity is removed? In two panels, Figure 7 shows the electricity prices from 2009 (the base year of the CGE model) to 2021 (panel a in the Figure). The price level in 2009 is normalized to one. In the Figure, the topmost line is for the base scenario policies, i.e. with the VAT on electricity and red tape cost in securing approval to start an electricity power generation business.

[25] The choice is motivated by the following: the introduction of VAT on electricity in 2005 and the global economic crisis in 2008.
[26] The equal expansion of labor and capital each year is to avoid any factor bias growth which may be embodied in the results of the simulation as well.

**Figure 1. Effect of the VAT and Red Tape on the Price of Electricity, 2009-2021**




Source: Author

The increase in prices in each of the 4 policy scenarios reflects the growth of consumption and supply of electricity. The slight growth of primary factors by half of a percent each year gives a balanced slightly growth of the economy, which in turn influences the demands and supplies of each of the products of the economy, including electricity. One may observe the difference in the respective rates of increase of electricity among the various policy scenarios. The steepest increase is the base scenario policies, followed by No VAT, then by No Red Tape, and then: No VAT, No Red Tape. It reflects that growth can push electricity prices much stronger if the industry is constrained by red tape.

In panel (b) of Figure 7, all prices are normalized to their corresponding level in the base scenario policy regime. Then the average of the 13 prices (2009 to 2021) is computed for each policy scenario and plotted in the panel. Without the VAT, the electricity price may go down by only 2%. Removing red tape or the unnecessary delay in issuing permits for power generation businesses makes a deeper dent on electricity prices.[27] The price of electricity is about 6% lower, compared to the 2% decline in the case of removing just the VAT on electricity. As explained above, red tape cost is paid upfront in terms of the effort and time expended in complying with the rules and following up of applications for permits. This is the smaller part of the cost. The larger part is in foregoing the value added for about 4 years due to the delay.[28] To recall the discussion in section 3, the estimated red tape cost is 12% of the capital services each year.

The two panels in Figure 7 show that price decline is stronger when red tape is eliminated compared to that of the VAT. The relative contribution of red tape to making electricity prices higher is three

[27] There is a necessary part in investment lag, i.e. the time comparable with other countries to build a similar plant, and the duration it takes to go through all the requirements. Benchmarking with other countries with similar requirements may help in ascertaining how much of the delay is unnecessary, which should be the red tape or the unnecessary part of the delay. This study, however, does not have the information on how much time it takes for investors in electricity generation in other countries with similar policy regimes. One may also look at benchmarking our regulatory regime, whether some regulations may turn out to have been necessary in the past but are no longer at present. In short, the study is at the high end of the estimate of the cost by failing to distinguish between necessary and unnecessary investment lags.

[28] Strictly speaking there is a legitimate investment lag, i.e. the time to build. However, in this analysis, all 3.7 years of delay in permitting, the length rounded off to 4 years, are included in the analysis.

times larger compared to the VAT on electricity. The former brings down the price by 6% compared to the 2% of VAT removal.

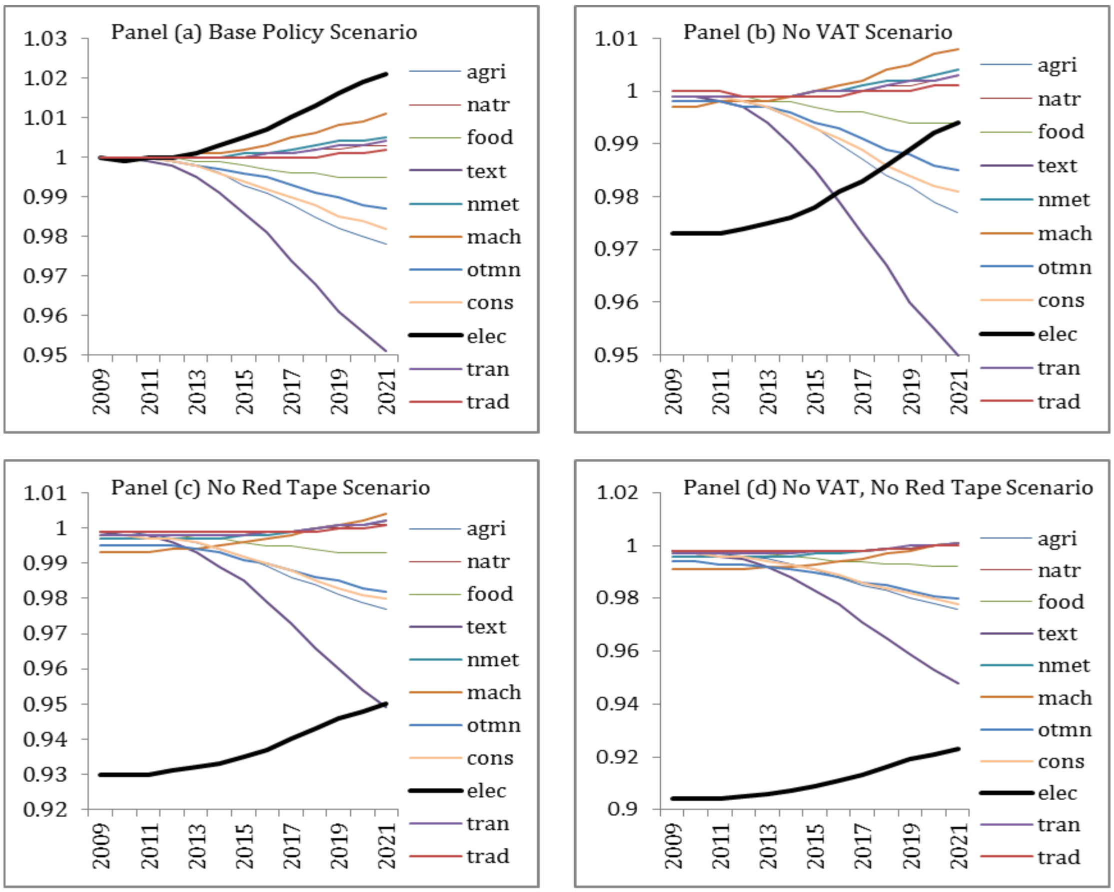
### Effects on Prices of Products of Industries

Electricity is an economy-wide input, and its price influences the prices of the products produced in the country. Figure 8 shows the effects of the VAT and red tape on electricity on the prices of the products of the other industries in the economy, particularly the goods. The electricity price is drawn more boldly than the rest and in black. Its decline is observed as the VAT, red tape or both are removed.

The price charts in the Figure depict some prices increasing throughout the simulation period, 2009 to 2021, and others falling. In the base policy scenario, prices are rising in about 8 industries, including electricity, and their prices also decline under the other policy scenarios. Similar pattern is observed for the 9 industries whose prices increase, i.e. they also increase. The interesting part, which is rather difficult to observe in the Figure, is that in a few industries whose prices fall, they fall even more particularly when red tape is eliminated. There are 4 industries whose prices increase where removing the red tape slows down the increase of their prices. This would seem to indicate that red tape has the stronger contribution in keeping electricity prices high, and in a way, the prices of other products as well.

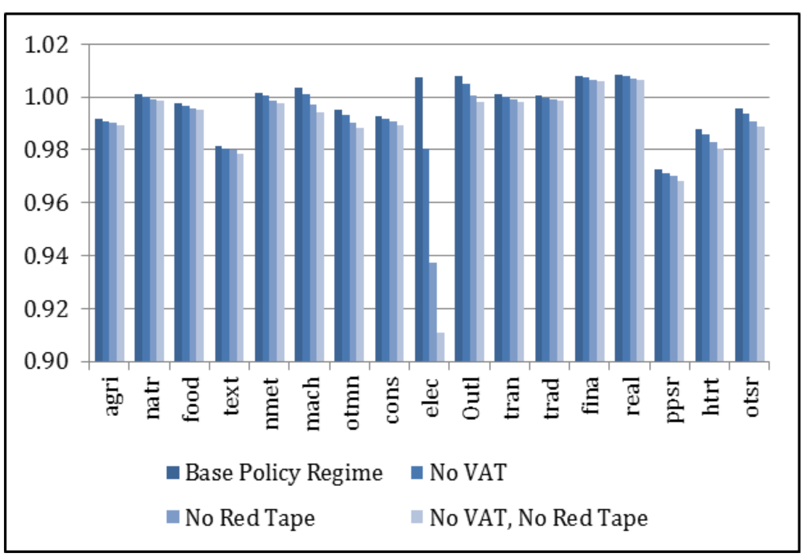
The effects on prices of products of removing the VAT or red tape is more apparent if the respective averages of the prices of each good from 2009 to 2021 is computed. The lifting of the VAT and red tape, which pulls the average electricity price, pulls down as well the prices of the other goods (Figure 9). Prices fall in all the policy regimes, with the removal of just the VAT reflecting the smallest reduction in prices. The changes are all less than a percent, except for the price of electricity, which falls by 2%, 6% or 9% for the policy scenarios of removing the VAT, red tape or both the VAT and red tape, respectively. However, the largest drop in prices occurs when red tape and VAT are removed.

**Figure 8. Effects of Electricity Prices on the Prices of Other Products, 2009 - 2021**




Source: Author

**Figure 9. Effects on Average Prices of Other Products, 2009-2021**



**Effects on Production**

Electricity production expands with the lifting of the VAT, of red tape or of both. The average production scale, i.e. the number you scale up the baseline output of the industry, from 2009 to 2012 is 2.02. This went up to 2.04 with the lifting of the VAT; to 20.09 with streamlining of the permitting business processes and to 2.12 with both reforms undertaken. Interestingly, all these happen while prices of electricity fall because of doing away with the VAT or red tape in the electricity industry. One possible explanation is that the rest of the economy is expanding given the changes in VAT or red tape, and the expansions require more electricity.

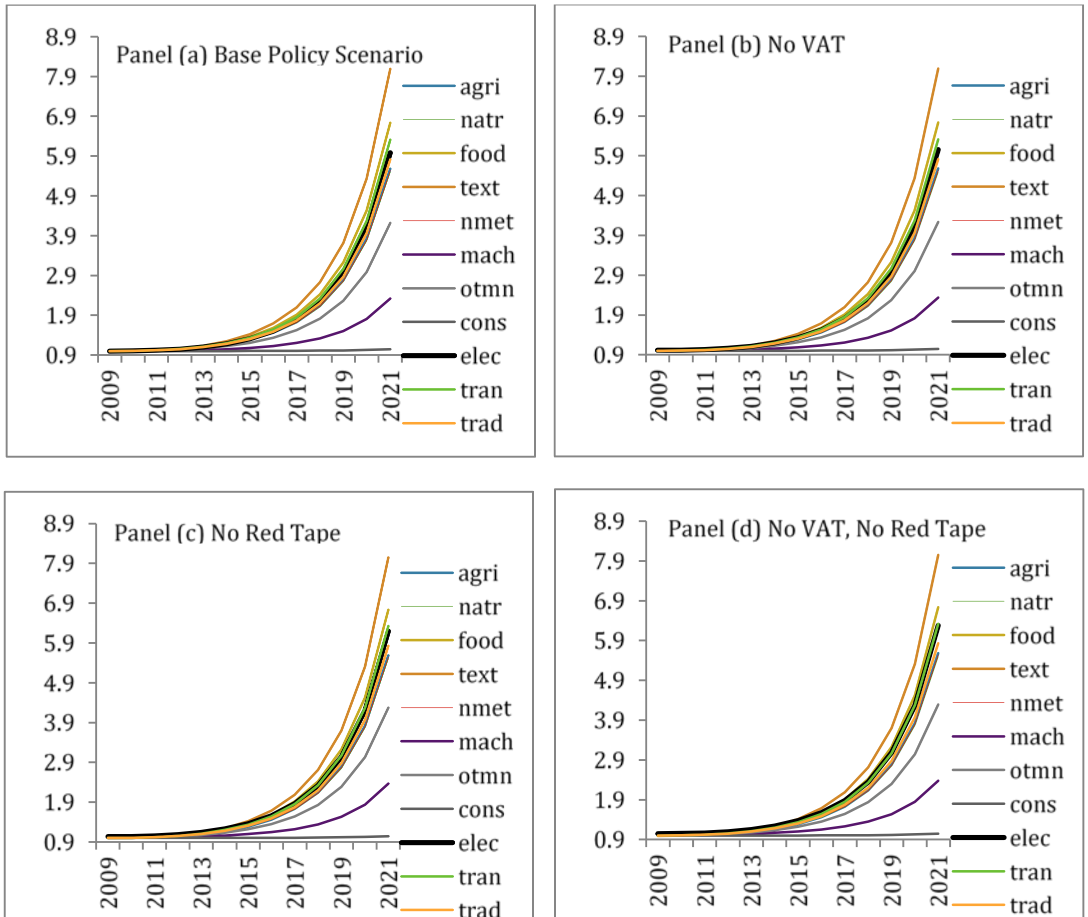
However, the plots of output scales from 2009 to 2021 do not easily show the contrasting ways of production expansions in all the other industries in the next 12-year period (Figure 10). Changes in electricity industry growth attributable to the lifting of the VAT or red tape drive the corresponding changes in the other industries. This seems to be the case with the ordering of the industries from slowest to fastest expansion.

The textile, garments and apparel industries register the fastest expansion under all policy regimes. It is followed by the following: hotels and restaurants; food and other services. The order of expansion of the industries in the middle of the list change depending on how the changes affect the electricity industry. Removing the VAT increases the output of the industry. But removing red tape has an even larger expansion effect. The shuffling in the middle range is because of the varying effects on electricity of the policy changes. The industries affected are: electricity; real estate; financial services and transportation. The industry with the lowest expansion is that of construction services. Machinery; other manufacturing; natural resources; non-metallic industries; agriculture; public administration and other services; trade and other utilities follow in that order and their ranking is unaffected by the policy changes.

The research compared the average production scales from 2009 to 2012 for each industry (Figure 11 (a)) and those of all other industries for each year (Figure 11 (b)), each presented by policy regime. The expansion of the industry attributed to the VAT or red tape may be apparent from the pattern of growth of the average production scale. This pattern is observed in the case of electricity, but is hardly apparent in the other industries. In fact, industry slow-downs were observed for the sector of public administration and services, as well as textiles.[29] The effects of policy changes on production may be more clearly observed in panel (b) of the figure. Using these indicators, the lifting of VAT, red tape or both expands production in all industries. The smallest gain is with the removal of the VAT, and the largest is if both VAT and red tape are eliminated.

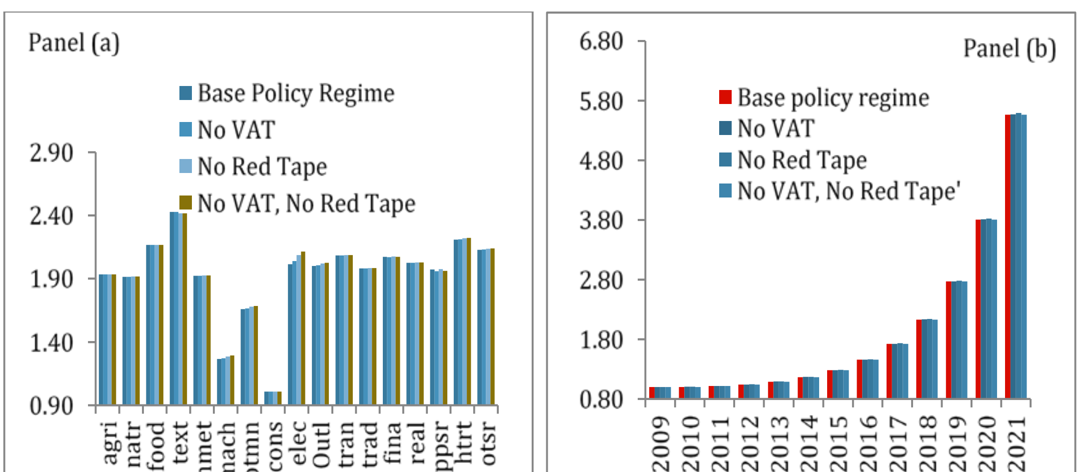
[29] That of public administration and services may be explained by possible loss in revenues from eliminating the VAT. The effect of red tape on revenues is unclear.

**Figure 10. Effects on Production, 2009 to 2012 by industry, year and policy regime**




Source: Author

**Figure 11. Effect on Production, by industry and by year**




Source: Author

## Effects on Tax Collection

Table 10 shows the estimated tax collection from internal indirect taxes and import duties. As noted above (footnote 20), the sector on public administration and services gets hit apparently with the lifting of the VAT. It is in the public interest to know how these changes may affect the tax incomes, with public spending levels affected by the tax income of the government.

The tax yields of the VAT are shown in the first part of the table under alternative policy changes considered in this study. In the base year, the total tax yield of the VAT for all the 13 years, 2009 to 2021, is PHP6,233 billion. The collection goes down by 3.4% or PHP212 billion if the VAT on electricity is lifted. Under the next column, the VAT is reinstated while red tape on electricity business permits is eliminated. The reform brings about a slight increase in tax income amounting to PHP21 billion. This may be explained by reinstating the VAT on electricity in the tax system. Moreover, the slight increase may reflect the efficiency gained without red tape, which in turn tends to expand the base of the VAT. If red tape and the VAT on electricity are removed, the economy still loses revenues of PHP197.7 billion or about 2.18%. Red tape reforms dampen the loss of lifting the VAT on electricity.

The lifting of the VAT can raise tax revenues by stimulating its base. The mechanism of getting this result is through the lower price of electricity, which can stimulate production activities everywhere in the economy, resulting in the expansion of the base of the remaining VAT. However, this study does not validate this claim. The government loses cumulative tax income of about PHP212 billion. The efficiency gain, however, in reforming the business permitting process has a dampening effect on this loss. Instead of losing PHP212 billion, the government ends up losing slightly less, about PHP199 billion of the VAT collection. This gain in efficiency likewise increases tax income amounting to PHP21 billion, which is more than what the government collects under the base policy scenario.

The prospect of the other tax measures, such as the import duty or other indirect tax measures getting their respective bases increased, is observed from a low of PHP4 billion of customs duties in the case of lifting the VAT to a high PHP30 billion in other indirect taxes in the scenario of lifting both the VAT and indirect taxes. Tax yields of the import duty and the other indirect tax measures increase by a few billion pesos. The percentage rises are all less than a percent. These gains, however, are less than what the government loses from removing the VAT on electricity. In summary, the total collection over the 13-year period, which amounts to PHP14,234 billion is reduced by PHP197.04 billion or better by PHP142.95 billion if one takes into account the added efficiency attained with removing red tape.[30]

[30] The policy simulations do not have a good handle of how direct taxes change if the VAT on electricity is lifted.

**Table 10. Effect on Tax Revenues of Lifting the VAT on Electricity**

| | | VAT and Red Tape on Electricity | No VAT on Electricity | No Red Tape on Electricity | No VAT, No Red Tape on Electricity |
|---|---|---|---|---|---|
| VAT | Total 2009-2021 | 6,233.26 | 6,021.65 | 6,253.85 | 6,034.81 |
| | Change | | -211.61 | 20.59 | -198.45 |
| Import Duties | Total 2009-2021 | 2,031.73 | 2,035.44 | 2,043.99 | 2,047.74 |
| | Change | | 3.70 | 12.26 | 16.00 |
| Other Indirect Taxes | Total 2009-2021 | 5,968.49 | 5,979.45 | 5,993.01 | 6,004.88 |
| | Change | | 10.96 | 24.52 | 36.38 |
| All Three | Total 2009-2021 | 14,233.49 | 14,036.54 | 14,290.86 | 14,087.43 |
| | Change | | -196.95 | 57.37 | -146.06 |
| VAT | Average Revenue | 479.48 | 463.20 | 481.07 | 464.22 |
| | Change | | -16.28 | 1.58 | -15.27 |
| Import Duties | Average Revenue | 156.29 | 156.57 | 157.23 | 157.52 |
| | Change | | 0.28 | 0.94 | 1.23 |
| Other Indirect Taxes | Average Revenue | 459.11 | 459.96 | 461.00 | 461.91 |
| | Change | | 0.84 | 1.89 | 2.80 |
| All Three | Average Revenue | 1,094.88 | 1,079.73 | 1,099.30 | 1,083.65 |
| | Change | | -15.15 | 4.41 | -11.24 |

Source: Author

In the lower panel of Table 10 are the effects on the average annual tax collection. For example, the average annual tax yield of the VAT in the base policy scenario is PHP480 billion. Removing the VAT on electricity costs the government PHP16 billion or 3.4 %, which is not a big amount of money considering total VAT collection is nearly half a trillion pesos. Getting rid of red tape dampens slightly this loss by 3.2% instead of 3.4%.

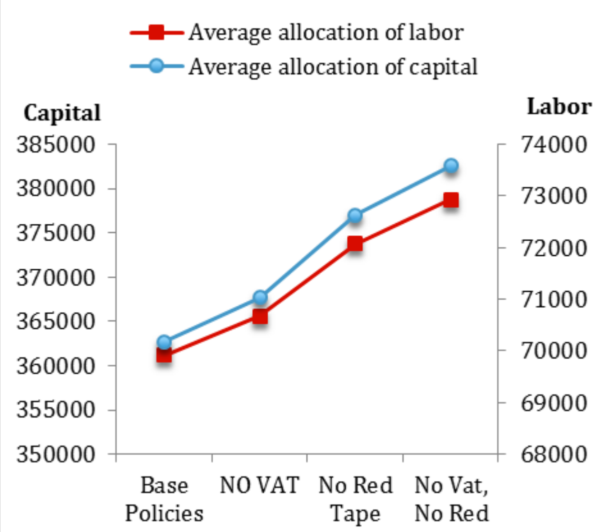
The average yearly tax yields of the import duty and other indirect tax measures increase from PHP300 million to PHP1.34 billion. Other indirect tax measures expand likewise from PHP.84 to 2.8 billion. With a tax collection of about PHP156 billion for the import tariffs to PHP461 billion for other indirect tax measures, these gains are negligible. The net impact of the lifting of the VAT, taking into consideration how the other tax measures change, may cost the government PHP15.15 billion or 11.5 billion when combined with eliminating red tape.

**Allocation of Resources in the Electricity Industry and GDP**

Figure 12 shows the changes in the allocation of labor and capital to the electricity industry. The changes in policies had attracted productive resources towards the industry, with removal of just the VAT attracting the least compared to either removal of just red tape or to removal of both the VAT and red tape. Although the simulations allowed factor neural growth, one observes in the figure that the industry attracts more investments. Its capital intensity appears to rise, particularly if the policy reforms involve removing red tape. This change is despite the lowering of the electricity price.

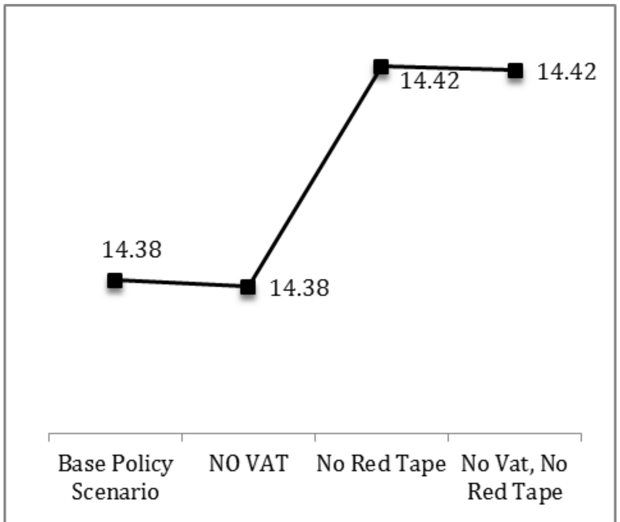
Another important reason to note is efficiency gain. The red tape cost as discussed above comprises the value added forgone by investors, and in the computation this study is taking the entire value forgone in 4 years of delay. Thus, when red tape is eliminated these resources that used to be unproductively spent or wasted in waiting becomes available to the economy for productive use. It is not, therefore, just the change in economic incentives in each industry because either the VAT, red tape or both are removed, but also efficiency gains which drive the improvements in the electricity industry and thus, the economy.

**Figure 12. Capital and Labor Allocation in the Electricity Industry (in million pesos)**




Source: Author

**Figure 13. Effect on the Gross Domestic Product (in trillion pesos)**

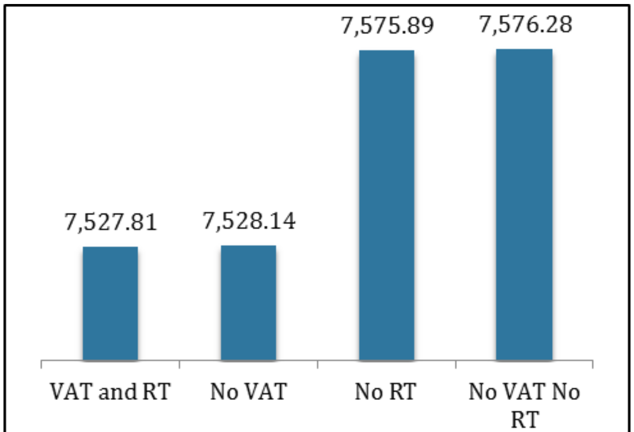



Source: Author

In Figure 13, a similar pattern is observed for the country's gross domestic product (GDP). It falls, but only by a small amount, from PHP14.42 trillion to PHP14.38 trillion if only the VAT on electricity is lifted. It jumps up again to its levels in the base year with the elimination of red tape, and slightly falls again. The slight fall may be attributable to the loss of tax income on the part of the government. The exercise of removing the VAT on electricity is not done in a way as to keep the tax income of the government constant. As such, the tax revenue that it loses reduces its spending, which in turn has ramifications no the rest of the economy. The government only spends on the product of one industry in this model: public and private services. It is the largest spender of it, and if it reduces spending, then the production of its product falls. In Figure 11 (a), public and private services do fall if the VAT rate is removed. Other industries use the product as well and lower output adversely impact their respective production activities, which may explain why the GDP slightly falls each time the VAT is removed.

There is however another distortion of incentives caused by removing just the VAT on electricity while keeping the rest. Partly because of concern to keep food prices low but more importantly because of the difficulty of collecting the VAT from the country's farmers and fisherfolks, primary agriculture is exempted from the VAT. This distortion raises the effective VAT of processed agricultural products (Clarete, 1991). In the same way, and considering that electricity is a major input into almost all productive activities in the economy, exempting it from the VAT tends to raise the effective VAT rate of the industries that use it. This mechanism, however, is not going to operate in this model since the VAT is featured as a straight tax on value added, instead of collecting it as a sales tax on the transaction less the VAT payments the tax payer made on its raw materials.

**Figure 14. Efficiency Gain of Alternative Policies (in billion pesos per year)**



Source: Author

Going back to the efficiency gain, the equivalent variation of income is computed and shown in Figure 14. The indicator is used to quantify the overall wellbeing of all consumers because of the respective changes in economic policies. In the figure, the obvious pattern is the big spike of the indicator if red tape is eliminated. With red tape gone, resources previously wasted are now available for productive use in the economy. For example, according to this theory, residents of the country are willing to pay PHP7.6 trillion to be as well off as if the red tape is eliminated. The bars in the figure are averages over the simulation period (2009 to 2021) of the respective equivalent variations of income under each policy scenario. All these bars capture the change associated with growth, i.e. the half a percent of balanced growth of labor and capital each year. Their differences reflect the effect of the policy change. [31]

## 5. Summary of Findings and Recommendations

High electricity prices are everyone's concern in the Philippines. Filipino residents have the highest residential electricity rates (Figure 1(a)) among the ASEAN 5 states except Singapore. The country's business sector bears the consequences of high electricity prices. Industrial use of electricity is relatively high in the country. The problem of high electricity tariff is often cited as among the important factors of the Philippines' low competitiveness ranking compared to its neighbors.

[31] There is a slight gain if the VAT is lifted, e.g. PHP30 million between the base policy scenario and No VAT or between No red tape and No VAT, No Red Tape. It may reflect the gain in productivity because electricity price is lower without the VAT. However, the gain is small compared to if red tape is eliminated, which is PHP3.7 billion.

This study looked at the relative contribution to the price of electricity of the value added tax (VAT) and the cost of doing business in the electricity industry of the Philippines. Those who advocated for the lifting of the VAT did so having the interest of relieving the burden of the residents and businesses of the relatively high price of electricity. Expected outcome of enacting the exemption of electricity from the country's nearly universal value added tax is the lower tariff on electricity. This claim amounts to saying that two wrongs make a right. It is already shown above that lifting the VAT without compensating for the loss in tax income has adverse consequence on the economy. But removing one tax would require increasing another. Suppose that the replacing tax leads to a larger waste of resources or what economists refer to as a higher marginal excess burden (MEB), then the economy shrinks, necessitating further tax increases. Economic welfare declines.

There is understandably wide support coming into the country to delist electricity use from the VAT system. This research looked at another possible explanation as to why electricity prices are high. It focuses on red tape in obtaining permits, and complying with all other regulations, the effective cost of which deters investment in new capacity. Lagging capacity to the growth of demand for electricity would likewise increase electricity prices as imposing the VAT on use.

**Study's Objectives.** The study explored the relative contributions of the VAT and red tape to business start ups for electricity power generation companies. It noted that the effective VAT on electricity is only about a third of the statutory rate of 12%. The country's VAT is collected as an assessment on sales at 12% less than the payments made by the taxpayer on its intermediate inputs. The net VAT collection is like taxing the value added of the electricity industry, which this study adopted in modeling the VAT. Considering the inefficiency in tax collection, the study regarded the VAT as a tax on factor use with the effective rate of 3.84%.

This research came up with its estimate of the cost of red tape. It is composed of the cost of complying with the regulations and the opportunity cost of income forgone by the investor because of the long approval process. The estimated cost of red tape is about 12% of the cost of capital services used up in producing electricity, i.e. the contribution of capital to the value added in generating electricity. In other words, red tape is like taxing capital used in electricity generation at 12% tax, albeit without the commensurate tax revenue.

Red tape has three effects: (1) The delays increase the required return; (2) The uncertainty increases the required return even further; (3) Red tape acts as a barrier to entry, thus reducing competitiveness of generation.

This covers both the start up costs in registering the business, going through the required permits from various regulatory agencies, which may reach about 4 years. The bigger part of red tape cost is forgoing the value added that the investor would have generated had it not been for the delays in getting the permits approved or the red tape.

**Effect on Electricity Prices.** As to the question raised by this study regarding the relative effectiveness of removing the VAT on electricity or the red tape in getting permits for starting electricity power generation. Without the VAT, the electricity price may go down by only 2%, i.e. from 13.6 to 13.3 cents per kwh. Removing red tape or the unnecessary delay in issuing permits for power generation businesses has a deeper dent on electricity prices. The price of electricity is about 6% lower, compared to the 2% decline in the case of removing the VAT on electricity, or savings of about 82 cents per kwh for electricity users. Removing red tape is three times as effective as removing the VAT on electricity in reducing electricity prices.

The lifting of the VAT and red tape that reduces the electricity price, generally also reduces the prices of the other goods.

**Tax Collection.** It may be believed that increasing the tax base by streamlining red tape will compensate for the revenue lost from exempting the power sector from the VAT. This turns out not to be the case, however. A concern of this research regards the size of the expected tax income loss to the government with the lifting of the VAT, and the analysis is done at the level of total collection over the 13-year period from 2009 to 2021. The collection goes down by 3.4% or PHP212 billion if the VAT on electricity is lifted. With the VAT in place but red tape eliminated, there occurs a slight increase in tax income amounting to PHP21.9 billion. This may be explained by the efficiency gained without red tape, which in turn tends to expand the base of the VAT and other tax measures. If red tape and the VAT on electricity are out, the economy still loses revenues, 197.7 billion or about 2.18%. Red tape reforms dampen the loss of lifting the VAT on electricity.

Advocates of lifting the VAT on electricity dismiss without evidence the concern of a tax income loss for the government. The argument is that the reform lowers electricity prices, which in turn stimulates economic growth. The prospect of other tax measures such as the increase in bases of import duty or other indirect tax measures occurs. Tax yields of the import duty and the other indirect tax measures increase by a few billion pesos. The percentage rises are all less than one. These gains, however, are inadequate to make up for the loss of tax income from the removal of the VAT on electricity. The same pattern of results applies if the analysis is done from year to year.

**Effects on Industry Output.** Electricity production expands with the lifting of the VAT, of red tape or of both. The average annual production scale for electricity, i.e. the number depicting how electricity output changes each year from 2009 to 2021 in response to alternative policy reforms, is 2.02 in the base policy scenario. This went up to 2.04 with the lifting of the VAT; to 2.09 with streamlining of the permitting business processes; and to 2.12 with both reforms undertaken, i.e. production increases by 5%. The smallest gain is with the lifting just of the VAT on electricity, i.e. a gain of .02, and the largest is if both the VAT and red tape are eliminated, i.e. 0.1. These average production scales reflect the respective effects of cheaper electricity and growth.

Using these indicators, the lifting of VAT, of red tape or of both expands production in all industries. The smallest gain is with the VAT removal, and the largest is if both the VAT and red tape are eliminated.

**Factor Use in Electricity Power Generation.** The changes in policies had attracted productive resources towards the industry, with removal of just the VAT attracting the smallest amount compared to either removal of just red tape or removal of both the VAT and of red tape. The power industry attracts more investments. Its capital intensity appears to rise, particularly if the policy reforms involve removal of the red tape. This change is despite the lowering of the electricity price.

Efficiency gains arising from savings in resources if red tape in the permitting process for new investors is eliminated may have caused the attractiveness of the industry again to resource owners, despite lower electricity prices.

The country's gross domestic product (GDP) expands by about PHP40 billion if red tape is removed. It falls, but only by a small amount, if only the VAT on electricity is lifted. It spikes up again to its levels in the base year with the elimination of red tape, and slightly falls again. The slight fall may be attributable to the loss of tax income on the part of the government.

This research made use of the CGE model. It is a tool for simulating the economic effects of policy reforms, applying competitive general equilibrium theory to the Philippine economy to analyze the proposals of lifting the VAT or alternative reform of streamlining the business permitting process. It does not capture the increasing returns to scale of the power industry, and this may be an area that future researchers may wish to endeavor. Other possible reforms that this model may do is to depict the industry more comprehensively, i.e. not just the electricity generation sub-sector, but also the distribution and transmission parts of the industry. This is useful to assess the economic implications of the move, which is mandated by EPIRA, to a more market-oriented retailing of electricity. Lastly, the application of the model to analyze better ways of dealing with environmental spillovers, which is to tax emissions rather than ban electricity power sources that are ordinarily seen as polluting the environment along the suggested approaches of Roumasset and Ravago (2016) and Alonzo and Guanzon (2016).

These results may suggest there is only a weak case for the removal of the VAT on electricity, in contrast to streamlining the business permitting process for new electricity power generation businesses in the country.

It is tempting to take the easier path of just delisting electricity from the VAT system. The reduction of the price is immediate and users are given relief. One regulator indeed argued for this in order for electric cooperatives to pay 10% lower dues for electricity. However, this study does point out a rather basic cause of higher prices of electricity: the capacity of generating electricity lags behind the expansion of demand, and the dynamics of it can significantly produce a price trajectory similar to what the country has had since the 1990s: rising electricity prices. This is one good explanation why the country has the lowest per capita use of electricity.

Between the two factors considered in this policy note, cutting the red tape in approving electricity power generation businesses carries more promise in undoing one of the important deterrents to investments and job creation in the Philippines.

Experts would caution that the business permitting process would entail a socially necessary time to complete, and only anything beyond it should be red tape. Benchmarking with similar business processes in other countries helps us understand which we can do away with. For example, consultations with indigenous peoples on projects in ancestral domains need to be accomplished. To cut down the socially unnecessary time, it helps to agree on the structure and duration how such consultations are to be done and incorporating these in implementing regulations.

The two-year grid impact study approval process is the elephant in the red tape problem. In hindsight, it reflects the loss of coordination among the agencies involved in regulating the industry– an unfortunate lapse of EPIRA. The law had moved the mandate of regulating and planning the development and operation of the country's electricity industry from the National Power Corporation to several players including the Energy Regulatory Commission, Department of Energy, National Grid Corporation of the Philippines and other agencies, depending upon the nature of the electricity power source. Without strong coordination among agencies, the elephant in the red tape would still be with us.

To drive this elephant away, a few suggestions to improve coordination are in order to unlock the coordination problem discussed in Section 2 above. The country has to have a transmission plan that takes into consideration the places where demand for electricity is high and those where generation activities have to be close to underlying sources of energy, this is particularly important for renewables. Although it may be best informed, the NGCP is not the ideal company to design the plan because it has a conflict of interest. It has the incentive of building up the highway that maximizes its profits. It is important that the transmission grids respond to maximizing the net value of the country's electric power system, not this private firm's profit nor even the present value of proceeds to the national government, which is presently mandated by EPIRA. Obviously, there can be several options of where to lodge the legal mandates in formulating the transmission plan, obtaining approval, and requiring the NGCP to come up with its planned investments following the approved transmission highway. This may be another area of regulating the NGCP by ERC--meeting the schedule of investments in accordance with the transmission plan.

Why not reduce the VAT and eliminate red tape? This study cautions against it because one cannot correct one distortion with another. Taking the electricity out of the VAT system introduces an unnecessary complication in the country's VAT system (Clarete, 1991). Besides, the country gains revenues by keeping the VAT on electricity as the business permitting process is streamlined and shortened, even as it enjoys a deeper cut in electricity prices.

This study looked at two of the several factors affecting the electricity price in the Philippines. There remain other factors that need to be examined. But with red tape eliminated, this research would have significantly provided the seed to bring electricity prices in the country hopefully to levels at par with the rest of the ASEAN region.

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**Table A.1. List of Electricity Power Stations in the Philippines**

| Power Station | Capa-city (MW) | Com-missioned | Community | Status | Source |
|---|---|---|---|---|---|
| BacMan Geothermal Production Field Energy Development Corporation (Produces steam for BacMan 1 and 2 power plants. Total 140 MW) | 0 | 1979 | Sorsogon City, Sorsogon | Operational | Geothermal |
| BacMan 1 Geothermal Power Station Energy Development Corporation (Steam is from BacMan Geothermal Production Field) | 120 | 1993 | Sorsogon City, Sorsogon | Operational | Geothermal |
| BacMan 2 Geothermal Power Station Energy Development Corporation (Steam is from BacMan Geothermal Production Field) | 20 | 1995 | Sorsogon City, Sorsogon | Operational | Geothermal |
| Leyte Geothermal Production Field Energy Development Corporation (produces steam for Malitbog, Mahanagdong, Upper Mahiao and Leyte Optimization Power Plants. 588.4 MW total) | 0 | 1975 | Kananga, Leyte and Ormoc City, Leyte | Operational | Geothermal |
| Malitbog Geothermal Power Station(Steam is from Leyte Geothermal Production Field) | 232.5 | 1996 | Malitbog, Tongonan, Kananga, Leyte | Operational | Geothermal |
| Upper Mahiao Geothermal Power Station (Steam is from Leyte Geothermal Production Field) | 125 | 1996 | Limao, Kananga, Leyte | Operational | Geothermal |
| Mahanagdong Geothermal Power Station (Steam is from Leyte Geothermal Production Field) | 180 | 1997 | Ormoc City, Leyte | Operational | Geothermal |
| Leyte Optimization Geothermal Power Station (Steam is from Leyte Geothermal Production Field) | 50.9 | 1997 | Tongonan and Limao, Kananga, Leyte | Operational | Geothermal |
| Tongonan Geothermal Power Plant(Steam is from Leyte Geothermal Production Field) | 112.5 | 1982 | Limao, Kananga, Leyte, Leyte | Operational | Geothermal |
| Mindanao Geothermal Production Field Energy Development Corporation (Produces steam for Mindanao 1 and 2 power plants. Total 106 MW) | 0 | 1987 | Mount Apo, Kidapawan City, North Cotabato | Operational | Geothermal |
| Mindanao 1 Geothermal Power Plant (Steam is for Mindanao Geothermal Production Field) | 52 | 1997 | Mount Apo, Kidapawan City, North Cotabato | Operational | Geothermal |
| Mindanao 2 Geothermal Power Plant (Steam is for Mindanao Geothermal Production Field) | 54 | 1999 | Mount Apo, Kidapawan City, North Cotabato | Operational | Geothermal |
| Northern Negros Geothermal Production Field Energy Development Corporation | 0 | | Murcia, Negros Occidental | Decommission ed | Geothermal |

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|---|---|---|---|---|---|
| Southern Negros Geothermal Production Field Energy Development Corporation (Produces steam for Palimpinon 1 & 2, Nasulo geothermal powerplants. Total 221.9 MW) | 0 | 1995 | Valencia, Negros Oriental | Operational | Geothermal |
| Palinpinon 1 Geothermal Power Plant (Steam is for Southern Negros Geothermal Production Field) | 112.5 | 1995 | Valencia, Negros Oriental | Operational | Geothermal |
| Palinpinon 2 Geothermal Power Plant (Steam is for Southern Negros Geothermal Production Field) | 60 | 1995 | Valencia, Negros Oriental | Operational | Geothermal |
| Nasulo Geothermal Power Plant (Steam is for Southern Negros Geothermal Production Field) | 49.4 | 2015 | Valencia, Negros Oriental | Operational | Geothermal |
| Tiwi Geothermal Power Plant | 275 | 1979 | Tiwi, Albay | Operational | Geothermal |
| Maibarara Geothermal Power Plant | 20 | 2014 | Santo Tomas,Batangas | Operational | Geothermal |
| Makiling-Banahaw (Mak-Ban) Geothermal Power Plant | 480 | 1996 | Brgy. Bitin, Bay, Laguna | Operational | Geothermal |
| Ampiro Geothermal Power Project | 30 | | Misamis Occidental | Proposed | Geothermal |
| Mt. Sibulan-Kapatagan Geothermal Power Project | 300 | | Davao del Sur | Proposed | Geothermal |
| Balatukan-Balingasag Geothermal Prospect | 40 | | Balingasag, Misamis Oriental | Proposed | Geothermal |
| Lakewood Geothermal Prospect | 40 | | Lakewood, Zamboanga del Sur | Proposed | Geothermal |
| Montelgao Power Plant | 44 | 2016 | Oriental Mindoro | Operational | Geothermal |
| Biliran Geothermal Plant | 49 | 2016 | Biliran | Under Construction | Geothermal |
| Agus 1 Hydroelectric Power Plant | 80 | 1994 | Marawi City, Lanao del Sur | Operational | Hydroelectric |
| Ambuklao Hydroelectric Power Plant | 105 | 2011 | Bokod, Benguet | Operational | Hydroelectric |
| Agus 6 Hydroelectric Power Plant | 200 | 1953, 1977 | Iligan City, Lanao del Norte | Operational | Hydroelectric |
| Agusan 2 Hydroelectric Power Plant | 1.6 | 1957 | Manolo Fortich, Damilag, Bukidnon | Operational | Hydroelectric |
| Ampohaw Hydro | 8 | 1991, 1996 | Sablan, Benguet | Operational | Hydroelectric |
| Angat Dam | 256 | 1968, 1978, 1992 | Norzagaray, Bulacan | Operational | Hydroelectric |
| Bakun AC Hydro | 70 | 2001 | Alilem, Ilocos Sur | Operational | Hydroelectric |
| Bineng Hydro 1 | 3.2 | 19,911,994 | La Trinidad, Benguet | Operational | Hydroelectric |
| Bineng Hydro 2 | 2 | 1991, 1996 | La Trinidad, Benguet | Operational | Hydroelectric |
| Bineng Hydro 2b | 0.75 | 1992 | La Trinidad, Benguet | Operational | Hydroelectric |
| Bineng Hydro 3 | 4.5 | 1992, 1994, 1996 | La Trinidad, Benguet | Operational | Hydroelectric |

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|---|---|---|---|---|---|
| Binga Hydroelectric Power Plant | 140 | 2013 | Itogon, Benguet | Operational | Hydroelectric |
| Bubunawan Run of River Hydroelectric Power Plant | 32 | 2021 | Agusan Del Norte | Under construction | Hydroelectric |
| Ferdinand L Singit Hydro | 5.9 | 1993 | Bakun, Benguet | Operational | Hydroelectric |
| Irisan Hydro 1 | 3.8 | 2011 | Tuba, Benguet | Operational | Hydroelectric |
| Irisan Hydro 3 | 1.2 | 1991 | Tuba, Benguet | Operational | Hydroelectric |
| Kalayaan Pumped-Storage Hydroelectric Project | 685 | 1983 | Kalayaan, Laguna | | Hydroelectric |
| Lon-oy Hydro | 3.6 | 1993 | Lon-oy, San Gabriel, La Union | Operational | Hydroelectric |
| Lower Labay Hydro | 2.4 | 1993 | Bakun, Benguet | Operational | Hydroelectric |
| Magat Dam | 360 | 1984 | Ramon, Isabela | Operational | Hydroelectric |
| Pulangi Hydroelectric Power Plant | 255 | 1986 | Maramag, Bukidnon | Operational | Hydroelectric |
| Pantabangan - Masiway Hydroelectric Power Plant | 132 | 1977, 1980, 2010 | Pantabangan, Nueva Ecija | Operational | Hydroelectric |
| Sal-Angan Hydro | 2.4 | 1991 | Itogon, Benguet | Operational | Hydroelectric |
| San Roque Dam | 345 | 2003 | San Manuel and San Nicolas, Pangasinan | Operational | Hydroelectric |
| Sibulan Hydro A | 16.5 | 2010 | Santa Cruz, Davao del Sur | Operational | Hydroelectric |
| Sibulan Hydro B | 26 | 2010 | Santa Cruz, Davao del Sur | Operational | Hydroelectric |
| Talomo Hydro 1 | 1 | 1992 | Brgy. Malagos, Davao City | Operational | Hydroelectric |
| Talomo Hydro 2 | 0.6 | 2005 | Brgy. Mintal, Davao City | Operational | Hydroelectric |
| Talomo Hydro 2A | 0.65 | 2005 | Brgy. Mintal, Davao City | Operational | Hydroelectric |
| Talomo Hydro 2B | 0.3 | 2005 | Brgy. Mintal, Davao City | Operational | Hydroelectric |
| Talomo Hydro 3 | 1.92 | 2005 | Brgy. Catalunan Pequeño, Davao City | Operational | Hydroelectric |
| Sabangan Hydro | 14 | 2015 | Sabangan, Mt. Province | Under-Construction | Hydroelectric |
| Linao Cawayan Mini-Hydro Power Plant | 3 | 2014 | Oriental Mindoro | Operational | Hydroelectric |
| Burgos Solar Power Plant (Energy Development Corporation) | 4.1 | 2015 | Burgos, Ilocos Norte | Operational | Solar |
| CEPALCO Cagayan de Oro Photovoltaic Power Plant | 1.1 | 2004 | Cagayan de Oro, Misamis Oriental | Operational | Solar |
| Surallah Photovoltaic Power Plant | 5 | | Surallah, South Cotabato | Under construction | Solar |
| Philippine Solar Farm Leyte, Inc. (PSFLI) | 30 | 2015 | Ormoc City, Leyte | Operational | Solar |
| Badoc-Vintar Photovoltaic Power Plant | 20 | | Badoc and Vintar, Ilocos Norte | Approved | Solar |
| SaCaSol I | 45 | 2014 | San Carlos City, Negros Occidental | Operational | Solar |
| islaSol I | 32 | | La Carlota, Negros Occidental | Operational | Solar |
| islaSol II | 48 | | Manapla, Negros Occidental | Operational | Solar |
| ECOGLOBAL INC. | 100 - 300 | 2015 | Zambo Ecozone, Zamboanga City | Under construction | Solar |

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|---|---|---|---|---|---|
| ADI | 2 | 2015 | Batangas | Operational | Solar |
| Solar Philippines | 63.3 | 2016 | Calatagan, Batangas | Operational | Solar |
| Solar Philippines | 1.5 | 2014 | SM Mall North Edsa | Operational | Solar |
| Solar Philippines | 0.7 | 2015 | Central Mall Biñan, Laguna | Operational | Solar |
| Raslag | 10 | 2015 | Mexico, Pampanga | Operational | Solar |
| Valenzuela Solar Energy, Inc | 8.6 | 2015 | Valenzuela, Metro Manila | Operational | Solar |
| MIRAE Asia Energy Corp. | 20 | 2016 | Curimao, Ilocos Norte | Operational | Solar |
| Cadiz Solar Power Plant | 132.5 | 2016 | Cadiz, Negros Occidental | Operational | Solar |
| Sindicatum Renewable Energy | 22 | 2016 | Mabalacat City, Pampanga | Operational | Solar |
| Enfinity S.A. | 28.6 | 2016 | Digos, Davao Del Sur | Operational | Solar |
| Citycor Power's | 25 | 2016 | Silay City, Negros Occidental | Operational | Solar |
| Burgos Wind Farm (Energy Development Corporation) | 150 | 2014 | Burgos, Ilocos Norte | Operational | Wind power |
| Philippine Wind Farm | 48 | | Puerto Galera, Mindoro | Under construction | Wind power |
| Bangui Wind Farm | 33 | 2005 | Bangui, Ilocos Norte | Operational | Wind power |
| Caparispisan Wind Farm | 81 | 2014 | Pagudpud, Ilocos Norte | Operational | Wind power |
| San Lorenzo Wind Farm | 54 | 2014 | San Lorenzo, Guimaras | Operational | Wind power |
| Pililla Wind Farm | 54 | 2015 | Pililla, Rizal | Under construction | Wind power |
| Sembrano Wind Farm | 72 | | Pililla, Rizal | Under construction | Wind power |
| North Negros BioPower | 24.9 | 2018 | Manapla, Negros Occidental | Proposed | Biomass |
| CLEAN GREEN Energy Corp. | 12 | 2017 | Bagac, Bataan | Under construction | Biomass |
| South Negros Bio Power | 24.9 | 2017 | San Carlos City, Negros Occidental | Under construction | Biomass |
| Green Power Panay Phil, Inc | 35 | 2016 | Mina, Iloilo | Under construction | Biomass |
| Green Power Bukidnon Phil, Inc | 35 | 2016 | Maramag, Bukidnon | Under construction | Biomass |
| Green Power Alcala Phil, Inc | 35 | 2016 | Alcala, Cagayan | Under construction | Biomass |
| Kalilangan Biomass Energy Corporation | 10 | 2017 | TBA, Mindanao | Under construction | Biomass |
| Don Carlos Biomass Energy Corporation | 10 | 2017 | TBA, Mindanao | Under construction | Biomass |
| Misamis Oriental Biomass Energy Corporation | 12 | 2017 | Misamis, Oriental | Under construction | Biomass |
| Aseagas Corporation | 8.8 | 2015 | Lian, Batangas | Operational | Biomass |
| San Carlos Bio Power | 19.9 | 2015 | San Carlos City, Negros Occidental | Operational | Biomass |
| Isabela Biomass Energy Corporation (IBEC) | 18 | 2015 | Alicia, Isabela | Operational | Biomass |
| Asea One Power | 42 | 2014 | Aklan, Panay | Operational | Biomass |
| Tokyo Electric Power Marubeni | 1294 | 1999 | Sual, Pangasinan | Operational | Coal-fired |

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|---|---|---|---|---|---|
| AES Corp. | 600 | 1998 | Masinloc, Zambales | Operational | Coal-fired |
| EGCO Group | 511 | 2000 | Mauban, Quezon | Operational | Coal-fired |
| Tokyo Electric Power Marubeni | 728 | 1996 | Pagbilao, Quezon | Operational | Coal-fired |
| Mariveles Coal-Fired Power Plant | 651.6 | 2013 | Mariveles, Bataan | Operational | Coal-fired |
| DMCI Holdings | 600 | 1984, 1995 | Calaca, Batangas | Operational | Coal-fired |
| APEC | 50 | 2006 | Mabalacat, Pampanga | Operational | Coal-fired |
| SMC Consolidated Power Corp | 600 | 2016 | Limay, Bataan | Operational | Coal-fired |
| Toledo Power Corp (Metrobank) | 246 | 1993 | Toledo, Cebu | Operational | Coal-fired |
| KEPCO-SPC Power Plant | 200 | 2011 | Naga, Cebu | Operational | Coal-fired |
| STEAG GMBH | 232 | 2006 | Villanueva, Misamis Oriental | Operational | Coal-fired |
| Lanao Kauswagan Power Station | 552 | 2017 | Kauswagan, Lanao Del Norte | under Construction | Coal-fired |
| PEDC Coal-Fired Power Plant | 167.4 | | Lapaz, Iloilo City, Iloilo | Operational | Coal-fired |
| Therma South, Inc. | 300 | 2015 | Brgy. Binugao, Toril District, Davao City | Operational | Coal-fired |
| Sultan Energy Philippines | 200 | 2012 | Sultan Kudarat | Operational | Coal-fired |
| SMI Power Corp. | 500 | 2016 | Malag, Davao Del Sur | Operational | Coal-fired |
| Bohol Diesel Power Plant | 11 | 1978, 1986, 1996 | Tagbilaran, Bohol | Operational | Diesel |
| SPC Cebu Diesel Power Plant | 43.8 | 1994 | Naga City, Cebu | Operational | Diesel |
| Cebu Private Power Corporation | 43.8 | 1994 | Cebu | Operational | Diesel |
| Panay Diesel Power Plant | 74.9 | 1999 | Iloilo City, Iloilo | Operational | Diesel |
| CELCOR Power Plant | 26.5 | 1996 | Cabanatuan, Nueva Ecija | Operational | Diesel |
| Western Mindanao Power Corporation | 100 | 1997 | Brgy. Sangali, Zamboanga City | Operational | Diesel |
| Ilijan Combined Cycle Power Plant | 1200 | 2000 | Batangas City, Batangas | Operational | Gas |
| San Lorenzo Combined Cycle Power Plant | 500 | 2002 | Batangas City, Batangas | Operational | Gas |
| Santa Rita Combined Cycle Power Plant | 1000 | 1997 | Batangas City, Batangas | Operational | Gas |
| Avion Open Cycle Power Plant | 97 | 2016 | Batangas City, Batangas | Under construction | Gas |
| Sucat Thermal Power Plant | 850 | 1986 | Muntinlupa | Decommissioned, For auction for recommissioning | Oil |
| Bataan Combined Cycle Power Plant | 540 | 1991 | Bataan | Operational | Oil |

Source: Wikipedia. 2016.